OURNAL OF THE AMERICAN
TATISTICAL ASSOCIATION

ADM.
RARY

PAPERS
AND
PROCEEDINGS

of the

Ninety-Sixth Annual Meeting

CHICAGO, ILLINOIS

DECEMBER 26-29, 1934

ARCH, 1935 · SUPPLEMENT · VOL. XXX · NO. 189A

American Statistical Association

Organized November 27, 1839

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MARCH, 1935 · PRICE $2.00 PER COPY · VOL. XXX · No. 189A

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Published Quarterly by the AMERICAN STATISTICAL ASSOCIATION
Publication Office: Box 552, Albany, N. Y. Editorial Office: 722 Woodward Building, Washington, D. C.

Acceptance for mailing at the special rate of postage provided for in Section No. 1103, Act of October 3, 1917, authorized April 29, 1922

Application pending at the Post-office, Albany, N. Y., as second-class mail matter.

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PAPERS

PROBLEMS OF RECOVERY

By Leonard P. Ayres

We are entering the sixth year of the great depression, but the 21st year of the causes of the depression. These causes are the economic disorders resulting from the World War. All important modern wars have been promptly followed by depressions, and in the cases of the truly major conflicts the return of peace has been followed about 10 years later by secondary and exceptionally long and severe depressions. Cases in point include the memorable depression beginning in England in 1825, a decade after Waterloo; the long depression of the 70's in this country beginning about 10 years after the close of the Civil War; the depression of the 80's in Europe 10 years after the Franco-Prussian War; and now this great world-wide depression starting 10 years after the close of the World War.

This present period has been characterized by one most important development that was not a feature of the earlier great secondary post-war depressions. That new feature is the almost universal appearance and continuing spread of economic nationalism. The War brought governmental intervention into the economic affairs of almost all nations on an unprecedented scale, and this movement of government into activities formerly left to business initiative has ever since been continued, and in recent years rapidly increased.

At this advanced stage in the great depression the business situations in most of the important countries of the world present a strange medley of the old capitalism and the new economic nationalism. In Russia the transition to the new has been complete. In Austria, Germany, and Italy the old forms survive, but governmental direction is controlling. In France, Belgium, and Japan private initiative survives, but directs its best efforts to striving for governmental favors. In this country Washington has become the

business as well as the political capitol of the Nation. In England alone the tide has been running the other way since the Coalition Government replaced the Labor Government in 1931, and the experiment is being tried of finding out what private enterprise can accomplish toward restoring business activity.

By far the most significant development resulting from the tide of economic nationalism that is sweeping the world is the clear evidence that in proportion as the control of government over business becomes increasingly detailed the procedures of democracy become enfeebled. Democracy has disappeared in Russia; it is almost gone in Italy and Germany; it has been seriously impaired almost everywhere else. It is becoming increasingly evident that a government cannot long continue with one-half of its people dependent for the material rewards of life on public legislation and public appropriations, and the other half dependent on their own unaided efforts. Such nations must move in one direction or the other, and most of them are continuing to move toward increasingly centralized control over the economic activities of their people. The result of the great War has been to make the world unsafe for democracy.

There is a delusively simple economic principle which largely accounts for the fact that governments which have deeply intervened in the business activities of their people in order to get out of the depression find themselves impelled to continue increasing and extending their control over the economic activities of individuals and corporations. It is a corollary of the familiar classification by which all production is divided into the two groups of consumers' goods, and durable goods. Consumers' goods consist of things that we use up or wear out and replace relatively quickly, such as food, clothing, gasoline, tires, soap, tobacco, and the like. Durable goods are long-lasting goods. They include buildings, machinery, automobiles, furniture, bridges, ships, locomotives, cars, and a long list of articles made of the metals, lumber, stone, clay, glass, and cement.

In times of depression these classifications emerge from the pages of the text books of economics, and become matters for discussion and concern among the public and on the part of their legislative representatives. This is because the central problem of every depression is that of unemployment, and we have recently realized that at such times the really serious unemployment among industrial workers is concentrated in the durable goods industries. During hard times we use as a nation almost as large quantities of food, clothing, and the other consumers' goods as we do when we are prosperous.

As a result there is not now, and has not been during the whole depression, any great volume of unemployment among the producers of consumers' goods.

On the other hand there has been, and continues to be, a most serious volume of unemployment among the makers of durable goods. Moreover we have recently awakened to the realization that the idleness of the nearly five million workers now unemployed in the durable goods industries, is the chief cause of the remaining unemployment of the five million workers in the service occupations, these two groups together largely constituting our present total of more than 10 million unemployed.

It is a significant fact that in broad general terms one-half of our unemployment causes the other half of it. The production of goods has fallen to levels far below normal, and it is because this has happened that there is widespread unemployment among the providers of services. It is because our output of goods is abnormally low that we require fewer workers in transportation, in communication, in the professions, in wholesale and retail trade, and consequently there are fewer opportunities for workers in the personal and domestic services.

If we could put the producers back at work and keep them employed the depression would be over. If we could solve the unemployment problems of the producers, the problems of the providers of services would solve themselves. Our problem of recovery is not that of finding jobs for over 10 million idle workers, but rather that of finding employment for almost five million producers, nearly all of whom are in normal times workers in the durable goods industries and in building construction.

Now when governments intervene in business in order to restore employment in industry they soon see that it is important to classify products as being either consumers' goods or durable goods, but some time elapses before they recognize the corollary that has been referred to which is that in the main the demand for consumers' goods is compulsory, while that for durable goods is voluntary. We cannot avoid or long postpone most of our purchases of such things as food, clothing, domestic fuel, soap, tires, and gasoline, and so such buying of consumers' goods is compulsory. That is why there is not even in depression times any great volume of unemployment among the producers of consumers' goods.

By contrast our purchases of durable goods are voluntary, for individuals and corporations alike are quite free to wait in buying them if they think it is to their advantage to do so. Most existing build-

ings can be made to serve for many years longer if it does not seem to their owners advisable to replace them. The same is true of locomotives, and cars, and ships, and bridges, and most household equipment, and to a considerable degree even of trucks and automobiles. The problem that must be solved by those who are guiding our experiments in economic nationalism is that of restoring employment in the durable goods industries. That means that they must somehow persuade voluntary purchasers to have such faith in the future that they will buy durable goods for future use.

When purchases of durable goods are being postponed those who are doing the most important waiting are largely the corporations, for in normal times they are the best customers of the durable goods industries. All manufacturing plants, and their machinery, all equipment of transportation, communication, and the public utilities, are furnished by the durable goods industries. Since the codes came into effect the costs of operation of most businesses have been advancing faster than production and distribution have been increasing. This has produced a pervading fear among executives that the extension of governmental regulation over the details of business operations will make it impossible for many corporations to make profits. The result is that under present conditions most corporations are spending as little as possible for improvements and replacements. They are waiting, and getting along as best they can with what they had before the depression.

There is still another reason why they wait, and that is that the production of durable goods is mostly financed by long term credits. Durable goods are not mostly bought in stores at retail as consumers goods are. They are largely purchased from the producers, and paid for by borrowed funds. Now our new legislation has made it very difficult for most companies to borrow money on any large scale, for it has almost strangled the flow of new corporate financing.

During last year and this the new capital raised by corporations through all forms of new financing has amounted to only two or three per cent of what it was in the years just before the depression. The reasons for this are to found partly in the pervading doubts about the possibility of making profits, largely in the persisting fears about the future of our money, in some degree in the virtual destruction through the new banking laws of our machinery for marketing new securities, and in no small measure in the almost impossibly expensive and time consuming regulations of the new Securities Act.

The experiments that have been tried so far by Government in this country in the attempt to get us out of the depression have not been

well adapted to persuade voluntary purchasers to invest in durable goods for future use. They have included a long series of monetary experiments and inflationary manipulations which have generated almost universal fears about the future of our money. They have consisted in part of numerous reform measures which have generated increasing doubts about the future, and in part of emergency expenditures now amounting to about as many billions as our military activities cost in the World War, and which have been relied upon to prime the business pump, and stimulate recovery. Despite these huge expenditures we now have about as many unemployed workers as we had a year ago.

It is not hard to see why our great federal spending program has not brought recovery. Several of the billions have been paid directly to individuals. These recipients include the veterans who got a bonus payment early in the depression, the farmers, the young men in the conservation camps, and the families on the relief lists. The sums they have received have been spent almost wholly for consumers' goods. Such payments could be continued for a long time on a huge scale without putting many people back at work in the durable goods industries where our great unemployment problem exists.

Other billions have been used in loans to bolster up weakened financial situations. They include the loans of the RFC to railroads, banks, insurance companies, and other corporations, and the billions advanced to refinance mortgages on farms, and on town and city homes. The effect of these expenditures has been rather to keep conditions from getting worse, than definitely to make them get better. They are props rather than propellants.

Most of the rest of the emergency expenditures have gone for public works, which are effective and costly means for providing employment, but which seem to have little continuing influence in stimulating business. The reason appears to be that spending for public works does nothing to cure the maladjustments between costs of production and the prices the public is willing to pay. These maladjustments between costs and prices are first among the factors that prolong the depression, and public spending for construction tends to increase them. At the present time costs of building are so high, and rents so low, that almost no one undertakes new construction. Private building is a form of voluntary buying, and people are postponing it until prices appear more attractive. Government building does not prime the business pump because it does not help work out the needed adjustments between costs and prices.

When governments intervene in business activities in order to get

their countries out of depressions they always begin by making the same three kinds of emergency expenditures that we have made in this country in this depression. They disburse money for relief, and usually experiment with different forms of made work before they resort to direct relief payments; they lend public funds to bolster up weakened financial situations; and they undertake programs of public works. These steps have been taken by many governments in numerous depressions before this one, and they do not normally lead to further steps into activities ordinarily reserved to business.

When, however, governments of capitalistic countries undertake to administer managed recoveries, as they have in this depression, they promptly encounter the difficulties that are inherent in the voluntary character of the enterprise that constructs private buildings, and of the purchasing that supports the durable goods industries. The revival of that voluntary purchasing is essential to recovery, and yet that is the part of our economy in which individuals and corporations have freedom to wait if they think it more advantageous or safer to do so.

Under such circumstances it is inevitable that governments should be tempted to intervene still farther into business activity, in the hope that ways may be found to make buying and building by corporations compulsory through public regulation, instead of letting it remain voluntary and subject to private decision. Their spokesmen complain of business not cooperating, which means that they resent the freedom which business retains to make voluntary purchases. They discuss the socializing of banking, which would not merely be of potent aid in a managed economy, but would eventually inevitably result in attaining it. Under such conditions the penetration of government into business becomes progressive, politics becomes decreasingly an activity of parties seeking power, and increasingly one of pressure groups competing for economic advantages. In those circumstances the principles of democracy fare badly.

Meanwhile we have as a nation a brilliant opportunity to secure a natural recovery, if we were willing to give up trying to achieve a managed recovery for business. The opportunity consists in the immense shortages in construction and durable goods that have accumulated during the depression. In the past five years business has been getting along with a minimum of additions, betterments, and replacements to its equipment. In the main it has been getting along as best it could with what it had before the depression, and many families and individuals have followed the same course with

respect to such durable goods as houses, household equipment, automobiles, and so forth.

The statistical total of such accumulated shortages amounts to something between 85 and 100 billion dollars worth. They do not all have to be made up, but a considerable part must be if as a nation we are to return to our former standards of living. If all the shortages had to be made up the durable goods and construction industries would have to operate at 25 per cent above their normal levels of activity for 10 years in order to supply them.

The present situation in our national economy is that we have huge shortages of goods that we need and want, millions of unemployed eager for work, and billions of idle capital seeking investment. Always before such a combination has promptly produced renewed prosperity. What we most need now is not greater public appropriations to build and make things, but a removal of the obstacles which now hold business back from taking advantage of the opportunity that is here.

These obstacles are not easy to remove, for they are artificial and political, rather than natural and economic. The most important ones are three in number. The first consists of nearly 5,000 new regulations controlling the conduct of business operations that are contained in the new codes. The second is continuing fear about the future of our money which is mainly based on the ever mounting budget deficits caused by our huge governmental expenditures. The third consists of the new regulations controlling the issuing of the securities by which the operations of heavy industry are financed.

If we should remove these obstacles we should not have to worry about the possibility of spending our way out of the depression with public funds, for we should then rapidly finance the recovery with private profit-making funds.

Whether or not we shall have as a nation the stamina of character to take advantage of the opportunity, only future developments can reveal. It has long been a maxim of finance that you can't unscramble scrambled eggs. It may be that we shall learn in the not far distant future that you can't unmanage a managed economy, and that in a democracy you can't persuade an economic nationalism to economize.

PROBLEMS OF RECOVERY FROM THE POINT OF VIEW OF AGRICULTURE

By Henry A. Wallace

From the point of view of agriculture the problem of economic recovery during the coming year is to correct severe maladjustments in three directions. Drought left agriculture unbalanced internally. Our task here is to get feed supplies and livestock numbers in balance once more. That is one problem. The second has to do with the maladjustment which exists, and has existed for some years, between agricultural and industrial prices and production. We seek a working balance between agriculture and industry. Our third problem is to restore, if possible, our foreign trade in farm products.

Of these three problems, it is the second which I wish to emphasize today, for it seems to me of supreme importance at this stage in national affairs. The problems of internal balance left us by the drought are certainly acute and vexatious, but the way out seems relatively clear. Reduction of our excess livestock had begun, fortunately, before the drought came to cut into feed supplies, but it has been necessary during the past year to make further adjustments at an unprecedented rate. Our efforts have been on the one hand to save as many stockmen and livestock from distress as possible, and on the other hand to utilize available stocks of feed and forage in every conceivable way. We have particularly tried to help stockmen hold on to their capital—their foundation herds. Acreages of feed grains will be higher than in 1934, and restrictions on the use of contracted acres for forage or feed will be few. It is extremely important, however, to avoid a wholesale, thoughtless expansion. We must continually point out to farmers the danger of letting drought mislead them as to future supply and demand. The land on which the huge surpluses of 1932 were produced, is still there.

Of the third problem, that of restoring our foreign trade in farm products, the solution simmers down to the willingness, or unwillingness, of American business and agricultural interests to permit increased imports. There are other factors, to be sure, but this question of imports looms largest in my own thinking. So whenever cotton interests plead for larger exports of cotton, I ask them what they are doing to bring about the increase in imports which must support, in the long run, any increase in exports. When business groups—or agricultural, for that matter—pass resolutions in favor of more

foreign trade, it is clearly up to them to follow the resolutions with action,—by such action, for instance, as having representatives present at every public hearing on reciprocal trade agreements to plead for more imports. For the people of a great creditor nation to plead for exports in one breath, and in the next breath to make imports impossible, simply does not make sense. America still must choose between nationalism and internationalism, or a middle ground between the two; and the time for choosing is getting short.

But it is the problem I placed second, having to do with the needed balance between agricultural and industrial prices and production, which particularly needs emphasis now, it seems to me. The gravity of the problem is suggested by the fact, too little stressed in business circles, that in 1934 agricultural production was roughly 15 per cent under that of 1929, whereas industrial production was about 40 per cent under 1929; that agricultural prices were still down about 40 per cent under 1929, whereas industrial prices were still within 15 per cent of 1929. Consequently the measure of our recovery in 1935, as I see it, will be determined principally by the price and production policies of industry.

Agriculture is more and more interested in this question of industrial production and prices because it has progressed about as far as it can in raising price by reducing supply. In fact, our adjustment programs for 1935 call for increases in supply. Any further increase in agricultural income, we believe, depends primarily upon a substantial increase in industrial production, which in turn means higher consumer purchasing power and greater national income. Agriculture, during the coming year, will probably produce within 90 per cent of 1929. Will industry do as well? If it does, then not only agricultural prices and income will improve, but industry itself, and the whole people, will benefit.

From the agricultural point of view this problem makes itself felt in any consideration of the farmer's share in the national income. Throughout the post-war period this share has been abnormally low, by comparison with the record of the past. Over the past seven decades there has been a fairly consistent relationship between the percentage of the gainfully employed working on farms, and the farmer's share of the national income. In 1870, with agriculture having 53 per cent of the gainfully employed, farmers received 26.5 per cent of the national income; in 1900, with 36 per cent of the gainfully employed, agriculture's share of the national income was 20.5 per cent; and in 1920, the figures were 26 per cent of the gainfully occupied and 17 per cent of the national income. For the

decade prior to 1930, then, the farm share of the national income historically should have been 15 or 16 per cent. Actually, according to a Brookings study, the percentage was 12.5 during 1921–25, and 10.7 during 1926–29.

By 1932, our estimates indicate, the farmer's share of the national income had fallen to 7.8 per cent. In 1934 the figure may be between 9.5 and 10 per cent, including benefit payments. But assuming that agriculture now has about 23 per cent of the gainfully occupied, the farm share in the national income should be—judged by comparison with roughly comparable periods in the past—around 14 per cent. This would mean an increase in farm income of around 2 billion dollars, or about 40 per cent above the 1934 level.

We know that this increase in farm income can best come from an increase in consumer incomes, which in turn will follow increased industrial activity. Doubtless some further increase in farm prices could be obtained by further reduction of agricultural supplies, but to pursue this course at this time would surely not be in the public interest. With most of the unwieldy, price-depressing surpluses disposed of, the time for drastic reduction is over, and the time for controlled expansion, for continuing adjustment, is here. If this is true of producers whose 1934 output was 15 per cent under that of 1929, it is doubly true of producers whose 1934 output was 40 per cent under that of 1929.

In terms of total production, industry is far from any satisfactory goal. In 1929 industrial production was more than three times that of 1900. A continuation of that 30-year rate of growth would call for a volume at the present time of approximately 325 per cent of the 1900 level. Actually, our recovery of 1933 and 1934 has placed us at a level of only 205 per cent of the 1900 level. To regain a volume in line with our pre-depression trend, we need an increase in industrial production of around 50 per cent. Until such an expansion takes place, there will continue to be a disparity between agricultural and industrial prices.

It may be that many industries cannot increase their volume of production unless and until they lower their prices. It may also be that the only way for many industries to make a profit in 1935 will be by lowering their prices in order to increase their sales, thus reducing their overhead costs per unit. Some business leaders contend that this is the only sound prescription for agricultural recovery, though they seem loath to apply it to industry. The truth is that though agriculture took that medicine up to 1933 in heavy doses, the prescription is not nearly so well adapted to agriculture

as it is to industry. For industrial products, unlike agricultural products, gross returns tend to be greater for larger volumes than for restricted volumes.

We may refer to the automobile industry for an example. Wholesale prices in 1934 were about 17 per cent or $110 below those of 1929; volume produced for sale in the domestic market was 50 per cent below. Analyzing the supply and demand factors for the commodity as we do for cotton or hogs, in order to see clearly the relation of volume to price, it appears that the demand for automobiles, as measured by the decline in national income, theoretically lowered the level of automobile prices by about $255. The effect of reducing volume by 50 per cent, however, was to support the price level by about $145, thus producing a net actual decline of only $110.

This is a quantitative illustration of how industrial prices tend to remain relatively stable during a period of drastic decline in demand. In consequence, our economic structure is half of putty, half of steel. Nothing so constructed can have any permanence. Either the putty-like prices have to be raised and made rigid, or the steel-like prices have to be lowered and made flexible. Producers whose prices are flexible cannot keep on exchanging goods with producers whose prices stay rigid; workers whose wages are flexible cannot continue to buy goods whose prices are rigid. I hope to see the day when business leaders, in conference assembled, will recognize and grapple with problems as fundamental as this.

Returning to our automobile illustration: Besides this decline of $110 in wholesale price, although a changing demand indicated a reduction of $225 in price, there is the question of gross return to consider. The 2,300,000 cars that were sold in 1934 at a wholesale price of $525 had a total gross value of 1.2 billion dollars. Had wholesale prices been reduced to about $400, however, 4,000,000 cars might have been sold at a total gross value of 1.6 billion dollars. This means about $400,000,000 or 33 per cent more for a larger volume than a smaller one.

I realize that the power to do this does not rest with the automobile industry alone. The producers of raw materials, the carriers, and the wage-earners, may be concerned. According to the 1933 census, approximately 80 per cent of the total product value of the motor industry went for materials, wages, and salaries, materials comprising about 70 per cent of the total value. A reduction in price of $100 per unit could not come out of the 20 per cent margin. Doubling the volume, however, would reduce the per-unit margin above materials, wages, and salaries by 50 per cent. On a $525 unit, this

would amount to about $50. The rest of the reduction would have to come out of materials, transportation charges, financing charges, etc. In my opinion this reduction might perhaps be obtained, for it is reasonable to assume that raw material manufacturers should be willing to scale down their prices by at least 10 to 15 per cent if the automobile industry could place orders with them for twice their present purchases. With materials in a $525 unit costing about $365, this sort of reduction would amount to between $35 and $55.

These two items alone—a reduction in overhead costs per unit, and a reduction in materials costs—would almost make possible the reduction in wholesale price required for the sale of 4 million rather than 2.3 million cars. The stimulus to economic recovery which would follow production of 4,000,000 rather than 2,300,000 cars, is very pleasant to contemplate.

You will bear in mind that I have used the automobile industry merely as an example, and that I do not claim final accuracy for these price-production relationships. Nevertheless, quantitative relationships of this sort, it seems to me, are at the heart of the general industrial problem. We shall have to examine and establish such relationships in all major industries if we are to approach our central objective of increased production for a higher level of consumption. The problem of competition between individual firms is a petty problem by comparison, and one, furthermore, all too likely to obscure the central objective of higher living standards. When industries begin to develop their programs as industries, not as individual firms worried only about their own competitive position, it will be reasonable to expect the emergence of a central, national objective.

I speak from the point of view of agriculture. I would speed the day when farmers could *afford* to produce more nearly at capacity. But I know this cannot happen until there is a far better balance than now obtains between agricultural and industrial prices and production.

In so far as we are interested in material things, our objective must be to attain the maximum output, at a price which can be paid, of those things which the rank and file of our people need and keenly desire. Before the statisticians lie the opportunity and the responsibility of developing the quantitative methods by which both output and price, industry by industry, can be measured.

PROBLEMS OF RECOVERY

By John Dickinson

To speak of economic conditions or policies to a group like this would be, in the language of theology, a work of supererogation. We at Washington are the performers on the stage; since God does not bestow the gift of seeing ourselves as others see us, you must tell us how we look—and I understand you have been doing so.

I remember what old Dr. Johnson once said of critics. A poet had been complaining about a particularly savage criticism and had retorted that the critic could not produce half so good a poem himself. Sir, said the Doctor, I am not a carpenter and I cannot build a house, yet I know mighty well whether a house is good to live in. And so it would be unfair to the critics to ask them to produce an economic policy which would be better than ours. Maybe they could —probably they could—yet if not, no matter.

I venture to enter into no competition with the critics, God bless them, and to make no answer to them. Rather I wish to fraternize with them as in a sense one of them. I too have been a critic in my time, as who hasn't? But what I more particularly mean is that I wish to fraternize with them as a fellow student of a problem which is the problem of all of us, and to say just a word about the approach to the critical task and about the standards and the yardstick which criticism applies.

Let me turn aside again for a moment to an outside field, the field of literary criticism. Too frequently I have noticed that the critic seems to develop some pet yardstick, some single standard which he magnifies into the touchstone of everything. One critic is a realist—he condemns every work which does not reek of the raw red meat of life—he will have none of it. Another is a humanist—nothing is good which does not celebrate the Puritan verities. A third is a protagonist of social reform—to him art is not art unless it has a political purpose.

I sometimes seem to recognize a trace of this critical worship of some single yardstick in the field of economic criticism—the obsession with a single test of economic health or of the wisdom of economic policy. It may be that there is some royal arcanum, some philosopher's stone or Aladdin's lamp which holds the secret of prosperity. And yet when I think of this exclusive attention to some single phase of a problem of enormous complexity, I am reminded of a remark

of the President when he said "Let us not close our minds to anything that may help us to help the country." I want to touch merely in passing on some of the particular panaceas that tend to take hold of critical minds today.

First there is the panacea of *more and more production*. There seems to be an idea that, if we simply go on producing more and more things, irrespective of what kind of things or whether anybody will or can pay for them, that means increased national wealth and prosperity. From this standpoint every form of production control falls under the ban just because it is production control. This doctrine seems to be an application to an economic good of the good old Biblical injunction to increase and multiply. Somehow we do not seem today overscrupulous to apply that maxim to the subject matter for which it was intended.

If we apply birth control to human beings there may possibly be some ground of argument for applying it to hogs and corn. After all, we do not eat as much fat-back as our ancestors did, and there are fewer of us. Froude gives us the breakfast menu of the Duke and Duchess of Northumberland in Queen Elizabeth's time. It consisted of a ham and a gallon of beer. Today our appetites take a different turn. With our foreign markets decimated, our population growth retarded and our dietary habits deranged, our production habits may conceivably be diverted with advantage into new channels.

A second panacea which seems to be very popular is connoted by the word *flexibility*. Everything which interferes with market flexibility, flexibility of prices, of wages, of production, everything in other words in the nature of a control, is questioned from the standpoint of this standard just because it interferes with flexibility. The difficulty is that some factors in the economic system are not and never have been flexible. The subsistence level is not flexible. Fixed charges are not in the ordinary sense flexible. In a civilized community the standard of living has, fortunately, elements of rigidity. So has a great deal of agricultural production.

These rigidities are *facts* which have to be accepted. We cannot hope or even desire to dissolve them into perfect flexibility. And with these rigid elements existing in the economic process, with this field marked off and segregated from the operation of flexibility, does it follow that everything else should be flexible? For example, can we dissolve, even if we would, the rigidities that inhere in the nature of large scale business enterprise? Where flexibility operates over only a part of the economic process anyway, is it any violation of a law of nature to seek to bring about a better adaptation of

some part of that field to the rigidities with which there must be an interplay? Surely flexibility is a means, not an end in itself; and control properly applied is but an agency for adapting flexibilities to rigidities—it is not necessarily an instrument of rigidity.

Let me refer to a third over-simplification which takes the shape of a pair of competing formulas—the formula on the one hand which sees salvation in the progressive accumulation of savings in whatever hands and the opposing formula which stakes all on the increase of purchasing power and expenditures. Surely we are dealing here with a pair of complementaries and not of opposites. There may be forms of saving and times when saving defeats its own purposes—when it simply builds up accumulations destined for destruction, through inability to put them to productive use. And again there may be ways of increasing purchasing power which likewise defeat themselves by increasing costs and retarding the economic processes from which in the long run all purchasing power must flow.

What I have just been saying seems to me applicable to much of the argument about reviving the production of durable goods. Many forms of durable goods are useful only as an adjunct to the supply of consumption goods. To multiply durable goods of a type which do not promise to result in ultimate satisfaction of consumers' demand is to promote waste and destruction of capital. To maintain or restore a high type of activity in industries producing durable goods of a type not adapted to the prospective needs of the coming technological and social era is likewise waste. The production of durable goods is no panacea in itself. Here also we need to recognize distinctions and differences.

In short, if I have said anything up to this point, it is simply this—that in our present economic system what is needed for recovery and health is not some simple cure-all, but a proper intermixture and balance of various remedial devices, and—what is just as important—a proper timing and succession in their use. A combination of hopeful measures may defeat itself because of improper timing. And to devise the proper timing requires obviously a continual flow of adequate current information as to all critical factors—it requires a statistical reporting system which will keep us adequately aware of the pertinent facts as to the economic health of the patient. Your President said last night in his illuminating address that our chief difficulty is that we still know so little about the processes which we must control if they are not to overwhelm us.

I happen to have to concern myself with some of the technical problems of statistical reporting because two of the reporting agencies

of the Federal Government, the Census and the Bureau of Foreign and Domestic Commerce, come under my immediate supervision. I know it is not necessary to assure you that more thought, and more expert thought, is being given to the improvement of the government statistical services today than at any time that I know of. Of course, there are difficult problems. Solutions will necessarily involve compromises. An ideally perfect system cannot be created full-born. More efficiency would be lost by sacrificing established relationships and contacts and set-ups than would be gained. Within these limitations, everything is being done, I believe, that can be done.

There has been a good deal of discussion as to the proper line between governmental activity and private activity in the field of collecting statistics. My own personal feeling is that, subject to proper governmental supervision and standards, every private agency that proves its ability to collect statistics adequately and accurately should be relied on by Government as an agency in performing the task. Where private agencies are already meeting these standards, there is no need for duplication of their work by Government, in my opinion. When in the future industrial agencies prove their title to similar confidence, they can in the same way relieve the work of Government. But obviously governmental oversight through supervision of forms and schedules and through periodic check-ups is essential to bring about uniformity and above all to insure absolute accuracy and fairness.

Within the Government itself a distribution of function between the established agencies has been worked out by time and experience. So far as possible in my opinion that distribution should not be disturbed. What is needed in the way of coordination and unification is being done in a splendid way by the Central Statistical Board, to the establishment of which Stuart Rice so largely contributed—and I say this with all due modesty as a member of that body. Something can be done in promoting the mechanical efficiency of collection and tabulation by greater use of a central mechanical agency provided an adequate system of staggering the work can be evolved. And finally, as Professor Pribram pointed out this afternoon, there is no doubt need for a central office of summary interpretation and analysis for administrative use. The beginnings of such a service, which is capable of large further development, exist in Mr. Riefler's office as coordinating statistician to the National Emergency Council.

RECENT MOVEMENTS IN INTERNATIONAL PRICE LEVELS AND THE DOCTRINE OF PURCHASING POWER PARITY

By Frank D. Graham

The doctrine of purchasing power parity in its simplest form merely asserts the correlation of exchange rates with the comparative purchasing powers of the currency units concerned. The underlying assumptions, however, are: (1) that the exchange value of an inconvertible currency is allowed freely to seek its appropriate level, (2) that general price movements are a function of the supply and turnover of money and will be confined to the area in which that supply and turnover is being altered and (3) that the normal sequence of causation is from prices to exchange rates rather than in the reverse direction.

If the facts were in consonance with these assumptions, the monetary policy of any country would be a matter of comparative indifference outside its own borders. Shifts in exchange rates would always compensate any divergent movement in two or more price levels and thus preserve a constant relationship between domestic and international prices for all of the countries concerned. Aberrations in any independent price structure would not be communicated to others and there would be no agitation in the channels of international trade.

So far, however, as exchange rates are not left free but are persistently manipulated on either side of the current purchasing power parity the tendency toward equilibrium in the internal and external value of currency units will be at least temporarily frustrated, the international price structure will be upset, and the course of both international and domestic trade will be greatly disturbed.

In the present wave of gold standard abandonment exchange rates have not been left free but have been deliberately kept at variance with purchasing power parity. This severance of internal and external purchasing powers of currencies arises from two antagonistic objectives—in the gold bloc and associated countries on the one hand and in the countries of devalued currency on the other. The desire of the gold bloc to maintain a full or halting gold standard, without devaluation of the monetary unit, is readily understandable as is the reluctance to deflate in the degree which this would seem to require.

The situation of the other countries arises partly from accident and

partly from design. Whenever, as a result of an outward drain of gold, the gold standard is abandoned, the immediate tendency is toward a fall in the exchange value of the currency concerned to a point much below the level appropriate to its internal purchasing power. Since there is no possibility of the gold or gold exchange value of such a currency rising above its original level, while it may fall to zero, all the speculative pressure falls on the bear side. Experience leads to the inference that, even where inflation is for the time being precluded, the drop in the exchange value of such a currency will run anywhere from 25 to 40 per cent.

This fall may be alternatively construed as a rise in the exchange value of the gold currencies. These currencies carry the special privilege of redemption in gold at a fixed figure. Where the desire for gold is suddenly enhanced by the widespread withdrawal of this privilege in other countries the gold currencies take on, for outsiders, an extraordinary value much above their commodity purchasing power in their own area of circulation. Their exchange value will, in consequence, be forced upward. In the absolute, it is a rise in the exchange value of the gold currencies which is then occurring but the universal tendency is to regard the movement solely as a fall in the exchange value of the paper monetary units. Though the deviation of exchange rates from purchasing power pars is probably twofold, the paper currencies moving down and the gold currencies up, there is no way in which it can be proved that the movement is bi- rather than unilateral or that, if unilateral, it is confined to the gold currencies.

Up to this point the disparity between exchange rates and purchasing powers is more or less attributable to panic and once the drop in the exchange value of the paper, or the rise in the exchange value of the gold currencies, is checked, the fundamental force of relative domestic purchasing powers operates freely to raise the value of the paper against gold exchange. The upward movement enlists a cumulative bullish support which may go far to reestablish the original pars.

Such a buoyant tendency developed, both in the pound and in the dollar, within a comparatively short period after the severance of their tie with gold. An equilibrating movement of this sort would ordinarily be welcomed as evidence of returning confidence in a shaky currency. The fear of an excessively valuable currency unit was so strong, however, that in Great Britain the equilibrating rise was checked, and in the United States reversed, by the action of the monetary authorities in freely offering currency against gold or gold

exchange at more or less overtly fixed, and arbitrarily low, prices. The existing deviations of exchange rates from purchasing power parity were thus deliberately confirmed or enhanced. The sequence, prices to exchange rates, had been shifted to exchange rates to prices. The condition of any free movement of international trade then became rising prices in the countries of devalued currency, falling prices in the other countries, or such a combination of the two as would restore something like the original price relationships.

Despite the assumptions of the purchasing power parity theory there is no general law governing these shifts of price level. They are rather dependent on time, place, and circumstance. The assumption of freely moving exchange rates in sequence to altered relative price levels being contrary to fact, the question arises as to whether price levels will move freely in response to altered exchange rates and, if so, whether such price movements as occur will be restricted to the countries which have followed a positive policy in the devaluation of their currencies.

Commodity prices are notoriously more sticky than exchange rates but, *a priori*, it is reasonable to suppose that the lowering of the gold content of a currency unit would not only lead to a larger volume of monetary counters on a given gold base but, by temporarily increasing the ratio of commodity exports to imports, would enlarge the base. The upward price movement might then be prompt and more or less closely confined to the devaluing country. This would be the more likely to occur: (1) when only one country devalues, (2) when, though several countries devalue, there is a great disparity in the degree of deviation from the original standard, (3) when the devaluation is a consequence of inflation and internal prices are already mobile in an upward direction, (4) when a policy of inflation, if not already in process, is actively initiated in all the devaluing countries, (5) when the international trade of such countries is a large part of their total commerce and, at the same time, a small part of the sum of international transactions.

None of these conditions was present in the widespread devaluation associated with the departure from the gold standard of Great Britain and its satellites in 1931 and they were present only in small part on our own departure in the spring of 1933. The result is that there has been a comparatively slight adjustment of price levels to altered exchange rates and such adjustment as has occurred has been outside rather than within the countries of devaluation.

The devaluation of the currencies of most of the countries which have abandoned gold has now come close to equality at from 40 to

50 per cent. Only in Argentina and Japan has the fall in the gold value of any important monetary unit been carried much beyond this level. With so many countries devaluing in almost equal degree, at a time when deflation rather than inflation had been in progress, there has been a strong tendency for the price structure in the devaluing countries to become the dominating factor in the world situation and thus to shift the burden of adjustment upon the countries which were maintaining the original gold content of their currencies. The devaluation of currencies in terms of gold did not result in a devaluation of the currencies in terms of commodities but rather raised the general commodity value of gold. Instead of the price structure in gold standard countries serving as the lode-star round which other price structures turned, the center of gravity was shifted to the modal bloc of currencies of approximately equal devaluation. Prices in these currencies are today practically the same as they were in September 1931,[1] while in the countries of the gold bloc there has been a fall of from 15 to 20 per cent.

It might, of course, be contended that gold prices would have fallen in any event and that the degree of devaluation effected in other countries was simply sufficient to remove this pressure. Had this been the case, however, the prices of domestic goods in the gold bloc countries would have fallen *pari passu* with the prices of export and import goods. There has been very little tendency in this direction. There can be little doubt, therefore, that the devaluation of the bulk of the world's currencies has been a very strong deflationary factor in the countries which have kept unchanged the gold content of their monetary units and that it has greatly distorted their price structure. The prices of internationally traded commodities, especially imports, in these countries are far below the price level of those goods which are subject only, or mainly, to domestic influences.

Far from devaluation promoting a unilateral movement of prices in an upward direction the inflationary effect in the countries of 40 to 50 per cent devaluation, on the other hand, has, typically, been negligible and the behavior of sectional prices in these countries shows no inverse correlation with price movements in the gold bloc. It is clear that, up to date at least, it is the price level, and exchange rates, of the countries of 40 to 50 per cent devaluation which determines the value of gold rather than the reverse. A French writer in commenting upon a recent speech of the British Chancellor of the

[1] In the United States there was a fall in the price structure from the autumn of 1931 to the spring of 1933. The subsequent recovery has not carried prices much beyond the 1931 level.

Exchequer says with scorn "It almost seemed as if he was going to say that sterling is immobile and that gold currencies are fluctuating around it." This statement, if it had been made, would not have been ridiculous or far from the literal truth.

The contention that it is the currencies of the sterling area and the United States, rather than gold, which are basic in the world price structure is confirmed by the fact that in the countries where devaluation has been carried considerably beyond the 50 per cent level we have phenomena inversely correlative with those of the gold bloc. In those countries there has been not only a sizable, though inadequate, rise in the general price level but the prices of imports and exports have far outstripped the upward movement in the prices of domestic commodities.

The outcome is that the world integration of prices, a fundamental of monetary and trade theory, is, for the time being at least, nonexistent. In its place we have a division of the countries of the world into three distinct price groups. Prices might, of course, be measured in any currency but it will be most convenient to express them in terms of gold. In the countries of Group I (the gold bloc and associates) the August 1934 index of wholesale prices in gold on a 1929 base runs from 71.7 in Germany through 63.3 in Switzerland, 58.0 in France, 56.6 in Poland, 54.5 in Belgium, 53.4 in Italy to 47.6 in the Netherlands. In the second group of countries, the group of 40 to 50 per cent devaluation which has dominated the world price structure, the August 1934 index of wholesale prices in gold centers remarkably closely around 45 per cent of the March 1929 level. Gold prices in the United Kingdom and the United States, in August 1934, were each 46.1 per cent of the 1929 figure, in Sweden 45.4 per cent, in Canada 45.3 per cent, and in New Zealand 44.4 per cent. In Australia and India they are somewhat lower at 40.6 and 38.4 per cent (July 1934) respectively of March 1929. China, with a gold devaluation of silver currency not far from the 40–50 per cent norm is in the same group with a gold price index 48.2 per cent of that of 1929. This is true also of Jugo-Slavia which has not devalued its currency so much but has deflated more and has a price index of 44.2 per cent.

In the third group we may take as representative countries Argentina and Japan whose currencies have been devalued to about 1/3 of their 1929 level and whose wholesale price indexes in gold (July 1934) are 34.5 and 27.7 per cent respectively of their March 1929 status. Table I gives more detailed figures for all of the countries above mentioned.

TABLE I

GENERAL INDEX NUMBERS OF WHOLESALE COMMODITY PRICES IN GOLD

(Arranged as of August 1934; March 1929=100)

Country	Per cent exchange devaluation Sept. 1934 (1929=100)	Prices March 1934	Prices July 1934	Prices Aug. 1934	Prices Sept. 1934
GROUP I					
Germany	Par	68.7	70.8	71.7	71.9
Austria	21.66	65.8	65.0	64.5	63.6
Switzerland	Par	64.1	62.7	63.3	—
Czechoslovakia	16.66	57.3	59.5	59.6	—
France	Par	61.6	58.5	58.0	57.1
Poland	Par	58.1	56.7	56.6	—
Belgium	Par	55.0	54.2	54.5	54.1
Italy	3.15	53.5	53.0	53.4	53.6
Netherlands	Par	48.2	46.3	47.6	47.6
GROUP II					
China	48.84	46.8	46.0	48.2	47.8
U. S. A.	41.30	45.0	45.6	46.1	46.7
United Kingdom	39.73	46.1	45.4	46.1	45.3
Sweden	43.57	45.4	45.6	45.4	44.7
Canada	39.55	44.5	45.2	45.3	—
New Zealand	51.88	45.1	44.4	44.4	—
Jugoslavia	22.79	45.5	45.3	44.2	45.8
Australia	52.15	40.4	40.6	—	—
India	39.59	38.5	38.4	—	—
GROUP III					
Argentina	62.73	34.8	34.5	—	—
Japan	64.93	28.0	27.4	27.7	—

Even with great restrictions on trade the prices of internationally traded goods must show some tendency toward equality in all countries. In view of the situation so far developed, we should therefore expect to find what has been already stated to be the fact—that the ratio of a composite of export and import prices to the domestic price level is low in the countries of high general prices, approximates parity in the central group of 40 to 50 per cent devaluation, and is high in the countries of greater currency depreciation. This, however, was hard to prove. Though its importance seems obvious, statisticians in but few countries have yet provided us with price indexes separated into export, import, and domestic commodities. I have therefore been under the necessity of constructing my own export and import price indexes for the more important countries and of comparing a composite index derived therefrom with the cost of living index as the best available for domestic prices.

Turning first to countries of the gold bloc we find that in France, since 1931, the index of the prices of international goods (in this case imports only) ranges from 46 to 52 per cent of the index of the

cost of living, in Germany from 45 to 55 per cent, and in Italy, where deflation of domestic prices has been drastic, from 68 to 73 per cent. Coming now to the countries of 40 to 50 per cent devaluation the ratio of the international price index to that of the cost of living moves, in Great Britain since 1931, within the range 77 to 83 per cent, in the United States, since 1933, within the range 76 to 92 per cent, in Denmark, since 1931, between 73 and 87 per cent, in Sweden between 77 and 88 per cent, in Norway between 82 and 98 per cent, in Finland between 82 and 111 per cent and in New Zealand between 88 and 108 per cent. Finally in Japan, representative of the countries of more extreme devaluation, the index of export-import prices has shown a ratio to the cost of living of from 132 to 152 per cent.

If integration of the world price structure is again to be attained much readjustment is still in prospect. There are no *objective* restraints on a rise in prices in the countries of Group II and, in some of these countries, it has been ardently desired. The monetary situation is such that a mechanistic quantity theory would lead to the belief that a strong upward swing is ultimately inevitable. But, if exchange rates are kept in anything like the present relationship, a simultaneous and approximately equal inflation in *all* the countries of Group II is essential to the restoration of parity. With greatly divergent views on monetary policy prevailing in the different countries this is by no means easy to engineer.

Domestic prices in the countries of greater devaluation such as Japan will almost certainly show a much sharper increase than has yet occurred but it is by no means so certain that all the countries in the gold bloc will submit to the deflation or devaluation likely to be necessary to bring their prices into line with that of the dominant Group II.

A marked and permanent disparity between national price levels is possible if international trade is sufficiently throttled, or even if merely revenue duties are laid on imports, and exports are correspondingly subsidized. There need then be no distortion of intranational price relationships. Import prices in the domestic market would be raised above the world level by the tariffs, export prices in the domestic market would be raised above the world level by the amount of the subsidies, and the play of intranational competition would bring the prices of purely domestic commodities into line with the intranational prices of imports and exports. The sole condition is a monetary supply adequate to support such a high price level.

The outlines of this situation are already apparent in Germany, which has no gold to lose, and they are also discernible in France

and other countries of the gold bloc. If these developments proceed farther we shall not improbably witness the permanent disappearance of the integration of world prices and of the last shred of validity to the doctrine of purchasing power parity.

From the point of view of the world at large devaluation has so far been a deflationary rather than an inflationary factor but its influence even in this direction is subject to check. The net result is a dislocation of price structures which, to date at least, has exaggerated the tendency toward economic nationalism and done much to counteract any benefits which the policy may have had in preventing a further fall of price levels in the countries of its adoption. The question may well be raised whether we should not divert our attention from merely stable exchange relationships to a consideration of the ratio which will restore purchasing power parity to important world currencies at such price levels as the several countries may desire.

A THEORIST'S COMMENT ON THE CURRENT BUSINESS CYCLE [1]

By J. A. Schumpeter

If we include monetary policy, variations of crops as far as due to weather conditions and so on in "factors acting from without on the economic system", much of what has happened since 1927 can undoubtedly be described in terms of such outside factors. If, however, we do not content ourselves with this (and I do not think we can), we must try to fit that period into a schema of those cyclical movements observable in practically all our historic data which we have come to call "business cycles", in order to form at least a rough guess as to whether or not the ordinary cyclical movement, as we know it for a period of over one hundred and fifty years, has been present in this instance. The irregularities inherent to the phenomenon of the cycle itself, the fact that it always has been distorted by outside factors, and the inadequacy of our statistical material are the reasons why in doing so we must so much rely on theoretical analysis and historical information instead of simply using, which of course we should much prefer, only the formal methods of statistics. Therefore we must first construct a theoretical model of economic change in time, meaning by the expression "theoretical model" exactly the same thing as is meant by it in physics. This model must then be justified in the light of economic history on the one hand and its concepts must be made amenable to definition in terms of time series material on the other. Although there is no logical objection to the practice of most students of the business cycle, who describe the phenomenon by means of assuming a single wavelike movement, a schema seems preferable which assumes, for descriptive purposes, the existence of three of them. Only one of the reasons for this schema is that there are actually three kinds of cycles, independently discovered by historians and statisticians. For the sake of brevity, we shall indicate them by three names associated with work that is generally known: Kondratieff, Juglar and Kitchen. Their periods are respectively about fifty-four to sixty, and nine to ten years, and forty months.

The year 1897, in some countries adjacent years, can be shown to have been comparatively "normal". From it arises the third of the three Kondratieff waves which we are able to follow up statistically.

[1] Summary prepared by the author.

Using the theory according to which the cycle is fundamentally the form in which economic change comes about and is absorbed by the pre-existing system, we can link up and interpret all processes reflected in the time series of that period as symptoms, or parts of the mechanism, of a Kondratieff upswing until about 1911, and we are also able to see the intermediate and short cycles running their courses within it. Leaving off with the outbreak of the war and beginning again with 1921, our analysis interprets the contour lines of business life since then as pertaining in a typical way exactly agreeable to theoretical expectation to the downgrade of a Kondratieff. Superimposed on it were Juglar and forty-month cycles, and the sweep down to August, 1932, and the "recovery" since then can pretty well be explained by the coincidence of the depressive phase of several cycles, although of course the intensity and the extent of the catastrophe can only be accounted for by outside disturbances, among which it is necessary to list a mistaken policy of trying to stabilize "prosperity plateaus".

THE FEDERAL FINANCES AND THE BANKING SYSTEM[1]

By James W. Angell

I propose to present here only some rather broad facts, and to draw only rather broad conclusions from them. Limitations of time and space prevent a more detailed discussion; and in any event such a discussion might merely cause the wood to vanish in the trees.

First, the present position of the Federal finances. The outstanding fact about them, from the monetary and banking point of view, is the fact that the Federal finances as a whole have been operating at a tremendous deficit. For several years past, total current expenditures by the Federal Government have vastly exceeded total current income from taxation. The balance has had to be obtained by borrowing. Since the post-war low point, which was reached in 1930, the public debt has increased by the enormous sum of 12 billion dollars.[2] Twelve billion dollars represents the direct outlay over and above tax yields, by the Federal Government *alone,* thus far undertaken to combat depression, and to finance relief and recovery. In addition, there are some 2 billions more of appropriations made but not yet expended, giving a potential aggregate to date of some 14 billions. Yet there is no definite indication that the present Administration is really interested in checking the ever more rapid growth of the public debt. Certainly no clear commitment to that effect has been made. This is the first broad set of facts.

Second, the money thus borrowed by the Federal Government has *not* come chiefly out of true individual and business savings. Roughly two-thirds of the money has in effect been created for the purpose by the banking system. On June 30th last, the total of commercial bank, savings bank, and Federal Reserve Bank investments in United States government securities alone amounted, as nearly as I can estimate it, to between 12.5 and 13 billion dollars. A conservative allowance for collateral loans on such securities would make at least another billion, or more. The banking system as a whole hence held roughly 13.5 to 14 billions of Federal securities last June. This was substantially half of the whole Federal debt on that date. This is not all, however. Since 1930, as already remarked, the Federal debt has increased by 12 billions. But since 1930 the banking sys-

[1] I am indebted to Dr. Caroline Whitney and to Mr. C. D. Bremer for assistance in collecting part of the statistical material used in this paper.

[2] Gross debt as officially reported, without deduction of Treasury cash balances, other direct or contingent assets, etc.

tem's total holdings of the resulting Federal securities, as nearly as I can estimate them, have likewise increased by at least 8 billions, and possibly more. Roughly two-thirds of the whole increase in the public debt has hence gone into the banks, instead of being absorbed by the real past savings of real investors. In effect, it has been financed by creating additional bank deposits.

When such a situation as this develops in times of peace, we are entitled to pause and ask questions. It is our common duty as citizens to examine the effects which the governmental inflation is likely to produce; and it is our duty to consider whether that increase in the government debt, which is the underlying cause of the inflation, is on the whole likely to be justified by the national benefits it may bring, despite the large direct and indirect costs entailed.

This governmental deposit inflation, considered for the moment as an isolated phenomenon, has had certain consequences that seem to me highly undesirable at present, and that are ominous for the future. First, a wholly artificial situation has been created in the money markets. The ever-growing volume of new government financing, instead of forcing interest rates slowly upward, as would normally happen, has forced them *down*. The proximate explanations of this are the pressure of the Treasury on the Reserve Banks to keep the money markets very easy, and thus hold the Treasury's interest costs down; and further, the fact that the commercial banks, in effect, cannot well refuse to absorb a large part of the ceaseless flood of new issues, and at low rates. If they do refuse, interest rates will rise, and the value of the government securities they already hold will fall. A large proportion of the banks could not easily carry even the paper losses which this fall would entail. The net result is that the money market is now artificially distorted; and that the government's credit, and the merits of its schemes, are not and cannot be subjected to unbiased judgment by the market.

Second, on a long view it can hardly be desirable that a large proportion of the assets of the commercial banks should consist of Federal government securities. Yet on June 30th last, one-third of all member bank loans and investments consisted of such securities alone. This seems entirely contrary to the ordinary understanding of what *commercial* banking is. I personally am inclined to believe that the total quantity of bank deposits should be kept comparatively constant, at least in short periods. But if the quantity is to vary at all, surely the variations should be related primarily to variations in the so-called "needs" of industry, commerce and agriculture, not to the current requirements of government finance. The present drift seems

to enforce the wrong kind of variations, mostly upward; and to immobilize a dangerously large proportion of bank assets and deposits. It also seems to imply an extensive abandonment of that self-liquidating principle, which was once held to be the keystone of good commercial banking.

Third, as an almost inevitable corollary of the government's fiscal policies, the Reserve Banks have come to be very largely dominated by the Treasury. In consequence, the major movements of the commercial banking system itself have likewise come to be thus dominated, in large degree. But the Treasury is, of course, merely a branch of the current Administration; and the Administration itself is primarily moved by current political considerations. Surely considerations of this latter sort should not be allowed to control the operation of the financial system as a whole. Manipulation in response to special group interests, and particularly in response to the demands of special and transitory political or economic doctrines, is too easy. The long-run welfare of the nation as a whole too quickly drops from sight.

Finally, the financing of increases in the public debt by the creation of additional bank deposits is itself a form of inflation. The danger here, however, lies more in the future than in the immediate present. A case can even be made for the view that, to date, this deposit inflation has been a good thing: that it has merely offset and prevented the further drastic contraction of total deposits which would otherwise have taken place, and that it has therefore really not been inflation at all. To date, this may well be so. But when and as business activity revives, this apparently happy situation will change. The industrial and commercial loans and investments of the banks will increase to a more nearly normal volume; and the additional government securities they hold will then become a true source of true additional inflation. Moreover, due in considerable part to the open market purchases of Federal securities by the Reserve Banks, the member banks alone already hold surplus reserves of close to 2 billion dollars. Unless checked in other ways, any general expansion movement can transform this surplus into an increase in deposits perhaps six to ten times as large.

When to this potential future inflation of bank deposits is added that potential future inflation of the currency, which the Federal Government can now impose, the economic and financial prospects of the country cannot be judged as other than ominous. Should such an inflation materialize in fact, I fear that the resulting boom and

inevitable subsequent collapse will make the violent perturbations of the past few years seem relatively minor events.

To these propositions and their implications there are a number of possible answers, some of which I do not dispute.

The first and strongest line of answer is, that we have been and still are confronted with a national economic emergency; that the Government cannot allow its citizens to starve or freeze; that in times of business depression, the only effective device for raising large sums of money quickly is governmental borrowing; and that if true past savings are inadequate to float the government loans, currency or deposits must be created for the purpose. I accept completely the validity of these contentions, as far as they go. The difficulty with them is that they apply to only a fraction of the total 12 billion dollar increase in the public debt.[3] To the end of last October, expenditures by the Government on direct relief projects had amounted to a little under 2.75 billions of dollars. Public works expenditures made rather over a billion more; but of these probably less than half can be regarded as constituting relief to individuals who would otherwise have been unemployed and destitute. Nearly all the rest of the 12 billion dollar increase in the public debt represents the costs of the R.F.C. and other re-financing schemes, of commodity price manipulation, of farm and home credit schemes, and the like, and deficits in the "ordinary" Federal budget. On a rough estimate, therefore, not more than 26 or 27 per cent of the total increase in the Federal debt to date has arisen from relief granted to destitute individuals.

A second line of defense for the increase in the public debt is the contention that government credit had to be extended to prevent the collapse of enormous business enterprises, the loss of farms and homes, and the like. In considerable degree, this is doubtless true. But the crisis phase of the depression now seems fairly well past, and these considerations hence cannot be advanced to justify *further* large increases in the public debt.

A third line of defense for the increases, and particularly for governmental deposit inflation, is the familiar proposition that "government spending stimulates business recovery." This general line of argument has already been examined by Professor Clark, and I shall not attempt to enlarge here on my own perhaps divergent views. I should like, however, to suggest three points for consideration. First, the government spending must not merely displace private spending that would otherwise take place, or its stimulus to business will be nullified. At least a part of our government spending has failed to

[3] See the U. S. Treasury, *Daily Circulation Statement*, Nov. 15, 1934, p. 4.

meet this requirement, especially in the public works field. Second, additional governmental spending is directly effective in increasing business activity, augmenting the national income, and in other ways improving general economic conditions, only as long as the governmental spending itself is continued. Unless we are to embrace a collectivist form of social organization, this additional spending must eventually cease. If its favorable effects are at last substantially beyond the date of its own termination, the governmental spending itself must be of such character that it stimulates and encourages the revival of private business activity, not the reverse. Otherwise we shall merely fall back, when the governmental spending ceases, to the depths we were in before it started, or further. Yet I believe that the character of much of the government's fiscal policies to date has been such as to discourage the activity of purely private business, and to shake its confidence, rather than to stimulate it.

In addition, I fear that a number of students, among them Mr. Keynes and his followers, substantially exaggerate the favorable effects which governmental spending can produce. Even under the most auspicious circumstances, I think that net additional expenditure by the government, effectively financed by the creation of additional bank deposits, can at most increase the national money income only by a limited and definite amount. This amount is the original expenditure, multiplied by the current "circular velocity" of money so-called.[4] Now even in the prosperous years before 1929, this multiplication factor (calculated from money in circulation plus total net deposits) was not higher than about 1.50 per year. At present, it is hardly as high as 1 per year, for the country as a whole—though for particular highly organized industrial regions it may run up to 1.25, or a little more. The coefficients Mr. Keynes has tentatively proposed, and which he obtains by rather different procedures, seem to me substantially too high.

The last principal line of defense for the current increase in the public debt, and again particularly for governmental deposit inflation, takes a rather different form. It consists in the contention that so-called "mild" and continuous inflation is itself a desirable thing. This too is good Keynesian doctrine, or was at last reports. To that contention, several partial answers are possible. For one thing, the phenomenon which is of chief importance in this country is not the governmental inflation which has taken place to date; so far, this

[4] On this concept, see my "Money, Prices and Production" (*Quarterly Journal of Economics*, Nov., 1933). Lack of space prevents presentation of the argument, extending the propositions advanced in that article, which supports the general conclusions suggested in the text.

inflation has admittedly been fairly mild. The important thing is the tremendous *future* inflation, neither moderate nor probably slow-working, with which the present situation and its probable development threaten us—when and if business activity recovers on a substantial scale. For another thing, the principal large effect of the depression in the monetary field has been not to reduce the *quantity* of money, taking currency and deposits together, but has been to reduce its velocity of circulation. Roughly speaking, the quantity of money is now only about 15 per cent below the 1928–29 average; but the velocity of money has fallen some 50 per cent—just about as much as the national money income. What is chiefly needed as a recovery measure hence appears to be a revival of velocity, not an increase in quantity. Finally, perhaps facetiously, it has been remarked by some that the case for so-called "mild" inflation is much the same as the case for "mild" murder. In each, the actual process is slowed down, but the final results are no less fatal.

HOW THE NATIONAL INCOME WAS SPENT 1919–29

By Clark Warburton

The purpose of this paper is to present estimates of changes in the percentages of the national income devoted to various purposes during the period 1919–1929. The data used in the discussion consist of estimates of the value of the gross national product and its components prepared in connection with the investigation of the Brookings Institution entitled, "The Distribution of Wealth and Income in Relation to Economic Progress."[1]

The value of the gross national product, which includes consumers' goods and services and new capital goods, as estimated in this investigation, is considerably larger than the amount of the national income as estimated by King, Kuznets and others. This difference is largely accounted for by the inclusion, in the gross national product, of (a) capital goods purchased from depreciation and depletion allowances, and (b) the cost of governmental services to persons and governmental outlays for capital purposes without allowance for the "inflation" or duplication of values which may result from taxation processes. Minor causes of difference are the inclusion, in the gross national product, of goods purchased at retail but not paid for (bad debts), goods and services furnished customers and employees by business enterprises but not included in individual incomes, goods and services purchased out of insurance benefits, and goods paid for through net credit expansion as measured by the change in the volume of means of payment. It is necessary to take these differences into consideration, if we wish to relate the estimated values of the components of the national product to the estimates of the amount of the national income.

Adjustment has been made for only one of these items, namely, depreciation. The total amount of depreciation on structures and equipment has been estimated on the basis of corporate depreciation allowances, and the relative volume of business conducted by corporate and non-corporate enterprises, with arbitrary allowances for depreciation on homes and public properties. As is true of many of the items embraced within the gross national product, these estimates are of necessity crude.

[1] These estimates were published in the Journal of the American Statistical Association, December, 1934. A few items have been revised since the tables published in that issue were prepared.

The remaining differences between the estimated value of the gross national product and the estimates of the amount of the national income hitherto available have not been ignored. It was decided, however, after consideration of the problems involved, to use the estimated value of the gross national product, adjusted for depreciation, as the amount of the national income for the purpose of computing the percentages of the national income devoted to various purposes. In respect to the major factor—that of the evaluation of governmental services—this method may be justified on either of two grounds.

First, it may be contended that the values of most of the items in the gross national product are inflated by the taxes paid by business enterprises and passed on to consumers, and that therefore these values should be reduced by the amount of such taxes. Practically, such an adjustment could be made only by arbitrarily reducing the values of all items by an equal percentage. This would be virtually the same, so far as computing percentages of the total is concerned, as taking the larger instead of the smaller base for the computation. At least the error involved would be small in comparison with the errors due to the crudity of many of the estimates of the separate items in the gross national product.

Second, it may be contended that the collection of revenue by governments from business enterprises reduces the money incomes of individuals connected with those enterprises to a greater extent than it increases the value of the goods sold to customers; and that the taxes and other revenue in question represent income diverted from individuals as such to the government as a collective agency. From this point of view the estimates of the value of the gross national product, adjusted for depreciation, may be considered a closer approximation to the size of the national income than the estimates currently used.

These observations are not designed to precipitate a discussion regarding the size of the national income—whether the total was approximately 85 or 95 billions of dollars in 1929—nor a discussion of the incidence of taxation; but merely to indicate some of the reasons for using the value of the gross national product, adjusted for depreciation, as the amount of the national income, when computing the percentages of the national income devoted to various purposes.

The values of the various items constituting the gross national product, adjusted for depreciation, are shown in Part A of Table I and in Table II, for the odd years during the period 1919–29. The

estimated percentages of the total devoted to these various purposes, for the same years, are given in Part B, Table I and in Table III.

TABLE I

COMPOSITION AND VALUE OF THE NATIONAL PRODUCT

	1929	1927	1925	1923	1921	1919
A. Value of the national product (millions of dollars)						
Food and non-alcoholic beverages	20,055	19,514	18,591	16,686	14,680	19,733
Shelter and home maintenance	22,356	22,456	22,763	22,043	19,360	16,375
Wearing apparel and personal care	13,669	12,942	12,415	12,707	9,723	11,852
Other consumers' goods and services	29,237	25,191	23,712	21,548	15,654	15,291
Structures and equipment	9,367	9,496	10,025	7,566	2,502	5,341
Change in inventories	145	—701	3,045	3,002	—4,902	7,569
Change in investment abroad	221	405	520	—21	875	2,236
Total for consumption [1]	85,317	80,267	77,189	71,616	60,870	59,914
Total for capital	9,733	9,200	13,590	10,547	—1,525	15,146
Total national product [1]	95,050	89,467	90,779	82,163	59,345	75,060
B. Percentages of total each year						
Food and non-alcoholic beverages	21.1	21.8	20.5	20.3	24.7	26.3
Shelter and home maintenance	23.5	25.1	25.1	26.8	32.6	21.8
Wearing apparel and personal care	14.4	14.5	13.7	15.5	16.4	15.8
Other consumers' goods and services	30.8	28.2	26.1	26.2	26.4	20.4
Structures and equipment	9.8	10.6	11.0	9.2	4.2	7.1
Change in inventories	0.2	—0.8	3.4	3.7	—8.3	10.1
Change in investment abroad	0.2	0.5	0.6	—0.02	1.5	3.0
Total for consumption	89.8	89.7	85.0	87.2	102.6	79.8
Total for capital	10.2	10.3	15.0	12.8	—2.6	20.2
	100.0	100.0	100.0	100.0	100.0	100.0
C. Percentages of trend values, based on peak years						
Food and non-alcoholic beverages	21.1	20.9	20.1	20.3	19.1	23.4
Shelter and home maintenance	23.5	24.1	24.6	26.8	25.2	19.4
Wearing apparel and personal care	14.4	13.9	13.4	15.5	12.7	14.1
Other consumers' goods and services	30.8	27.0	25.7	26.2	20.4	18.2
Structures and equipment	9.8	10.2	10.8	9.2	3.3	6.3
Change in inventories	0.2	—0.8	3.3	3.7	—6.4	9.0
Change in investment abroad	0.2	0.4	0.6	—0.02	1.1	2.7
Total for consumption	89.8	86.1	83.5	87.2	79.3	71.1
Total for capital	10.2	9.9	14.7	12.8	—2.0	18.0
Non-production	0.0	4.0	1.8	0.0	22.7	10.9
	100.0	100.0	100.0	100.0	100.0	100.0

[1] Except for 1929, these totals do not exactly equal the sums of the various items. This is due to an adjustment for changes in inventories. See Table II.

In 1929, for which the estimates are the most reliable, 89 per cent of the total was devoted to consumption and 11 per cent to capital goods. Of the amount spent for consumption, approximately one quarter went for food, and another quarter for shelter and home maintenance. The two categories of attire (including wearing apparel and personal care) and transportation, also absorbed a fourth of the total for consumption. The remaining quarter included communication, health and medical care, protection and civil services,

education and reading matter, social organizations, recreation and art goods, and stimulants.

Taking the entire period into consideration, three particularly important facts are revealed.

(1) A high degree of stability in the percentages of the national income spent for the various categories of consumers' goods and services during the period 1923–29.

(2) A sharp decline in the percentage spent for food and a sharp rise in the percentage spent for shelter and home maintenance, from 1919 to 1921—changes presumably due to variations in relative values rather than to variations in the physical volume of purchases.

(3) Much sharper fluctuations in the percentages spent for capital items than for consumers' goods and services—the percentage spent

TABLE II

COMPOSITION AND VALUE OF THE NATIONAL PRODUCT, 1919-1929

(Millions of dollars)

	1929	1927	1925	1923	1921	1919
A. Consumers' goods and services						
Food and non-alcoholic beverages						
Meat	4,422	3,878	3,715	3,056	2,675	3,989
Dairy products	4,195	4,065	3,713	3,566	2,693	3,192
Other proteins and fats	2,772	2,675	2,592	2,082	1,597	3,889
Cereals and bakery products	2,626	2,584	2,581	2,127	2,177	2,975
Vegetables, fruits and nuts	3,220	2,991	3,239	2,885	2,254	4,131
Sugar, confectionery, condiments and non-alcoholic beverages	3,057	3,057	2,959	3,081	2,375	3,641
Adjustment for industrial use[1]	—1,323					
Adjustment for preparation of meals[2]	1,086	—214	—227	—202	—169	—233
Adjustment for trade margins[3]	—	478	19	91	1,078	—1,851
Shelter and home maintenance						
Rentals (rented homes, owned homes and room rentals)	13,081	13,892	14,611	14,114	13,238	9,824
Home equipment & decoration	4,702	4,234	4,251	3,859	2,692	3,085
Household supplies & operation	4,573	4,330	3,901	4,070	3,430	3,466
Wearing apparel and personal care						
Clothing and shoes ready-to wear	8,582	8,270	7,876	8,211	6,491	7,655
Clothing materials and making	2,272	2,261	2,449	2,647	1,884	2,524
Jewelry and articles of apparel	730	661	634	617	402	679
Care of clothing and apparel	958	770	600	467	364	371
Personal care	1,127	980	856	765	582	623
Other consumers' goods and services						
Transportation	8,122	7,123	6,928	6,051	4,646	4,775
Communication	935	789	748	659	546	539
Health and medical care	3,556	3,179	2,788	2,503	2,059	2,123
Protective and civil services	1,652	1,396	1,297	1,259	1,166	1,092
Education and reading matter	3,626	3,235	2,883	2,524	1,733	1,410
Social organizations	1,458	1,411	1,449	1,353	1,441	1,308
Recreation and art goods	3,658	2,831	2,392	2,016	1,478	1,010
Stimulants	6,230	5,227	5,227	5,183	2,585	3,034
Adjustment for changes in inventories[4]	—	164	—292	—1,368	1,453	—3,337
Total for consumers' goods and services	85,317	80,267	77,189	71,616	60,870	59,914

TABLE II—Continued

	1929	1927	1925	1923	1921	1919
B. Capital goods						
Structures and equipment						
Residential buildings	3,508	4,374	4,788	3,413	1,936	1,792
Commercial and industrial buildings	2,104	1,866	1,820	1,398	785	1,194
Public & semi-public buildings	960	1,073	1,076	732	632	358
Highways and streets	1,333	1,166	1,076	700	304	176
Other transportation structures	1,106	1,515	1,287	1,185	713	634
Public utility structures	1,649	1,205	1,179	1,003	564	328
Machinery and equipment	5,748	4,640	4,724	4,681	2,921	5,634
Miscellaneous public works, buildings, agricultural improvements, and engineering construction	1,034	1,102	915	728	466	756
Gross total structures and equipment	17,442	16,941	16,865	13,840	8,324	10,872
Depreciation	—8,075	—7,445	—6,840	—6,274	—5,822	—5,531
Net total structures and equipment	9,367	9,496	10,025	7,566	2,502	5,341
Changes in inventories						
Finished goods	—354	—164	292	1,368	—1,453	3,337
Materials & semi-finished goods	946	—764	1,281	2,196	—1,313	4,101
Farm stocks	—447	227	1,472	—562	—2,136	131
Change in investment abroad	221	405	520	—21	875	2,236
Total capital goods	9,733	9,200	13,590	10,547	—1,525	15,146
Total national product	95,050	89,467	90,779	82,163	59,345	75,060

[1] Estimated value of food used in industry, which cannot be allocated to the various categories.
[2] Restaurant mark-up and services of professional cooks at home.
[3] Estimates given for the various categories of food are based on index numbers of producers' values. The adjustment for variable trade margins is based on a comparison of the Bureau of Labor Statistics indexes of wholesale and retail food prices.
[4] Estimates of amounts for years other than 1929 based on index numbers of production. It is consequently necessary to make an adjustment for changes in inventories of finished products.

for all capital goods dropping from 20 per cent in 1919 to minus 3 per cent in 1921, rebounding to 13 per cent in 1923 and 15 per cent in 1925, and then declining to 10 per cent in 1927 and in 1929. The negative percentage in 1921 resulted from the fact that the estimated value of inventories used up, together with the estimated depreciation on structures and equipment, amounted to more than the estimated value of new structures and equipment and new investments abroad.

In order to bring out more clearly the differences between the most prosperous and the less prosperous years, and to indicate the relation of changes in the demand for final products to fluctuations in production, the amounts spent for the various categories may be expressed as percentages of what the national income, or value of the national product, would have been, had production been relatively as great as in the best years. This potential value of the national product, in the years when production was relatively low,

TABLE III

PERCENTAGES OF TOTAL NATIONAL PRODUCT IN CERTAIN SUBCLASSES OF PART B, TABLE I

	1929	1927	1925	1923	1921	1919
Other consumers' goods and services						
Transportation	8.5	8.0	7.6	7.4	7.8	6.4
Communication	1.0	0.9	0.8	0.8	0.9	0.7
Health and medical care	3.7	3.6	3.1	3.0	3.5	2.8
Protective and civil services	1.7	1.6	1.4	1.5	2.0	1.5
Education and reading matter	3.8	3.6	3.2	3.1	2.9	1.9
Social organizations	1.5	1.6	1.6	1.6	2.4	1.7
Recreation and art goods	3.8	3.1	2.6	2.5	2.5	1.3
Stimulants	6.6	5.8	5.8	6.3	4.4	4.0
Structures and equipment						
Residential buildings	3.7	4.9	5.3	4.2	3.3	2.4
Commercial & industrial buildings	2.2	2.1	2.0	1.7	1.3	1.6
Public and semi-public buildings	1.0	1.2	1.2	0.9	1.1	0.5
Highways and streets	1.4	1.3	1.2	0.9	0.5	0.2
Other transportation structures	1.2	1.7	1.4	1.4	1.2	0.8
Public utility structures	1.7	1.3	1.3	1.2	1.0	0.4
Machinery and equipment	6.0	5.2	5.2	5.7	4.9	7.5
Miscellaneous public works, buildings, agricultural improvements and engineering construction	1.1	1.2	0.9	0.9	0.8	1.0
Depreciation	—8.5	—8.3	—7.5	—7.6	—9.8	—7.4
Changes in inventories						
Finished goods	—0.4	—0.2	0.3	1.7	—2.4	4.4
Materials and semi-finished goods	1.0	—0.9	1.4	2.7	—2.2	5.5
Farm stocks	—0.5	0.3	1.6	—0.7	—3.6	—0.2

TABLE IV

PERCENTAGES OF TREND VALUES OF NATIONAL PRODUCT, BASED ON PEAK YEARS, IN CERTAIN SUBCLASSES OF PART C, TABLE I

	1929	1927	1925	1923	1921	1919
Other consumers' goods and services						
Transportation	8.5	7.6	7.5	7.4	6.1	5.7
Communication	1.0	0.8	0.8	0.8	0.7	0.6
Health and medical care	3.7	3.4	3.0	3.0	2.7	2.5
Protective and civil services	1.7	1.5	1.4	1.5	1.5	1.3
Education and reading matter	3.8	3.5	3.1	3.1	2.3	1.7
Social organizations	1.5	1.5	1.6	1.6	1.9	1.6
Recreation and art goods	3.8	3.0	2.6	2.5	1.9	1.2
Stimulants	6.6	5.6	5.7	6.3	3.4	3.6
Structures and equipment						
Residential buildings	3.7	4.7	5.2	4.2	2.5	2.1
Commercial & industrial buildings	2.2	2.0	2.0	1.7	1.0	1.4
Public and semi-public buildings	1.0	1.2	1.2	0.9	0.8	0.4
Highways and streets	1.4	1.3	1.2	0.9	0.4	0.2
Other transportation structures	1.2	1.6	1.4	1.4	0.9	0.8
Public utility structures	1.7	1.3	1.3	1.2	0.7	0.4
Machinery and equipment	6.0	5.0	5.1	5.7	3.8	6.7
Miscellaneous public works, buildings, agricultural improvements and engineering construction	1.1	1.2	1.0	0.9	0.6	0.9
Depreciation	—8.5	—8.0	—7.4	—7.6	—7.6	—6.6
Change in inventories						
Finished goods	—0.4	—0.2	0.3	1.7	—1.9	4.0
Materials and semi-finished goods	1.0	—0.8	1.4	2.7	—1.7	4.9
Farm stocks	—0.5	0.2	1.6	—0.7	—2.8	0.2

has been estimated in Table V on the basis of a trend line drawn through the peak values of an index of production. The percentages of the potential value of the national product, as thus estimated, which were devoted to the various categories of final products are shown in Part C of Table I and in Table IV.

It will be noted that there was throughout the entire period a remarkable regularity in the percentages of the trend values of the

TABLE V

COMPUTATION OF TREND VALUES OF THE NATIONAL PRODUCT, BASED ON PEAK YEARS

	1929	1927	1925	1923	1921	1919
Index of physical output (1900=100)[1]	271.4	245.0	238.9	230.7	158.2	179.7
Readings from trend of maximum values[2]	271.4	257.0	244.0	231.0	218.0	204.8
Ratio of index to trend of maximum values	1.000	.953	.979	1.000	.726	.877
Value of national product, excluding rentals (millions of dollars)	81,969	75,575	76,168	68,049	46,107	65,236
Trend value of national product, excluding rentals[3]	81,969	79,302	77,802	68,049	63,508	74,385
Rentals	13,081	13,892	14,611	14,114	13,238	9,824
Trend value of national product (based on peak years)[4]	95,050	93,194	92,413	82,163	76,746	84,209

[1] Composite derived from indexes of physical output in agriculture, mining and manufacturing. See Nourse and Associates, *America's Capacity to Produce*, p. 547.
[2] When the index of physical output is plotted, the points for the years 1916, 1923, 1926 and 1929, all peaks, lie on a straight line. The values given here are readings from this line.
[3] Value of national product, excluding rentals, expanded on basis of ratio of index of physical output to trend of maximum values.
[4] In current dollars, that is, without adjustment for changes in the level of prices from year to year.

national product in peak years devoted to the various categories of consumers' goods and services. Some categories of consumers' goods and services show a steady and substantial growth, notably transportation, communication, health and medical care, education and reading matter, and recreation and art goods. The remaining types of consumers' goods and services show little change during the period as a whole. There are few departures from the trends, only three being worthy of mention: (a) A decline from 1919 to 1921 in the percentage spent for food and an advance in the percentage spent for the home; (b) a decline in 1921 in the percentage spent for wearing apparel and personal care below the level for the entire period and a compensating rise above that level in 1923; and (c) the high level of the amount spent for stimulants in 1923 and later years as compared with 1919 and 1921.

The capital goods, on the contrary, show very sharp fluctuations. The depression of 1921, and the recession in 1927, may be attributed almost completely to reductions in the purchase of structures and equipment and in the building up of inventories. Nevertheless, despite the importance of fluctuations in the capital items, the years of the most intense economic activity, 1923 and 1929, were the years when the value of all consumers' goods and services stood at the highest percentages of the potential value of the national product. Further, there was a tendency over the decade for the percentage spent for consumers' goods and services to increase, broken only by a moderate reduction from 1923 to 1925.

THE USE OF STATISTICS IN THE STUDY OF CONSUMER DEMAND

By Henry G. Weaver

In the handicraft age the small scale producer enjoyed an intimate personal contact with his customers and was able to arrange his purchasing, plan his "production," meet changes in the style trend and direct his sales with a finesse that is not easily excelled by the modern manufacturer with all his highly specialized organization facilities. Modern manufacturing methods have brought new products and tremendous savings to the consumer. Mass production and mass distribution have tended to obscure the fundamental necessity of reckoning with the detailed tastes of the individual buyer.

If a company can ascertain concretely and in detail just what its buyers would like to have, if it can build and service its products in conformity with those desires and design its sales and advertising messages so that they will definitely answer the questions that are uppermost in the mind of the consumer, obviously there will be a continued improvement in the merchandising processes and a broadening of the service rendered.

Just a few words about technique: While there are thousands of text books on statistical analysis, there is a dearth of literature on questionnaire technique. There is a general tendency to over-stress the mechanics of the thing and to neglect what we might call the art of extracting information. Even the advertising agencies, who are supposed to be masters of psychology and who go in strong for color effects, enamel printing paper and typographical artistry, manage to find some wood pulp paper and revert to the crudest printing processes when it comes to issuing a questionnaire.

Out of our basic studies of technique we have laid down certain ground rules which may interest you:—

Before even setting out to design a questionnaire, we ask ourselves these questions: 1. What do we want to find out? 2. Why do we want to find it out? 3. What can we do about it after we find it out?

Some questions are important, but it is well-nigh impossible to get dependable answers through any kind of questionnaire technique. Others are interesting and may satisfy a healthy curiosity; but the answers may not be suggestive of any direct course of action. Still others are significant as bearing on an individual transaction or

limited group of transactions, but practically worthless in terms of broad, general averages or even in terms of frequency distributions.

Failure to achieve mathematical exactness does not necessarily vitiate the value of the results. Even though it were possible to get results that were accurate down to the last decimal place, it is difficult to conceive how the action based on such results could ever be reduced to such hairsplitting fineness. For example, whether the consumer's vote indicates 75 per cent preference or 95 per cent preference, the action taken would, at best, be more or less arbitrary and probably the same in either case.

The principal value of the findings will, in many instances, lie not so much in any one isolated figure, as in comparisons of different figures, not only of different items but also of the results obtained in different years. This fact further emphasizes the necessity for exercising the greatest care in the initial framing of the questions. This is easily the most important problem with which we have to deal. A few ground rules for framing questions may be listed:

1. We cannot be satisfied in shaping the question merely so that it can be understood. Design it so carefully that it simply cannot be misunderstood.

2. In dealing with technical features of a product emphasize not the mechanical construction but the effects attained through these features.

3. Observe the rules of good etiquette, and guard against ballyhoo and insincerity. Be good natured; but avoid being a "smart alec".

4. Employ phraseology that is common usage with the consumer, even though such phraseology may not represent the best scientific terminology.

5. Remember that we are asking the consumer to do us a favor. Observe the principle of "give and get". Since generally speaking the kind of people to whom we are catering cannot be bought by any pecuniary rewards within our reach, our giving must be in the nature of information or mental satisfaction.

While the foregoing rules are important as a guide and check, development of a good questionnaire is such a subtle and illusive problem that it can never be reduced to a formula. No set of ground rules can ever eliminate the necessity of testing a questionnaire before it is adopted for extensive use, just as we find it necessary to test a new automobile model on the proving ground before going into production.

THE CONSUMERS' PLACE IN THE ORGANIZATION OF THE NEW DEAL

By Thomas C. Blaisdell, Jr.

Previous to the New Deal there existed within the Government a small number of bureaus which have given real attention to the problems of the consumer. Outstanding among these are the Bureau of Home Economics and the Food and Drugs Administration of the Department of Agriculture. Other bureaus, such as the Bureau of Mines, the Bureau of Standards, the Bureau of Agricultural Economics, and Public Health Service have also given attention specifically to consumer problems. However, in general, this phase of their activities has been relegated to a minor position. The bureaus have approached their problems primarily from the standpoint of producers. Organized producer groups have been in a position, both by means of economic and political pressure, to insist that their particular interests should be served. The consumer interest has been so diffused that it is only when it has been directly connected with the interest of some producer group that it has been expressed with any authority.

The extent to which this protection of the producer interest has gone is shown by the activities of the Federal Trade Commission in its attempts to prohibit unfair methods of competition under the Federal Trade Commission Act. Challenges of the Commission's orders prohibiting certain types of unfair trade practices have been upheld by the courts on the ground that injury to the consumer is not *ipso facto* unfair competition. The unfair competition arises only out of injury to a trade competitor as a result of a particular practice. This approach to the protection of the consumer through the producing groups is deeply embedded in our social thinking. In fact, much of our political thinking has been postulated on the premise that by means of competition between producer groups the consumer is most adequately protected.

The New Deal is one evidence that much of the economic reasoning of the past has come into question. The community at large is well aware that the ideal competition about which so much has been written is not the competition which exists in modern business activity. Monopoly has been evident on every hand. Long before the antitrust laws were officially waived by the enactment of the National Industrial Recovery Act, the courts and the administrative decisions

of various government agencies had already waived those Acts. It is also fairly well recognized among economists today that the anti-trust laws themselves have probably been an important factor in the development of corporate forms and trade organizations which establish executive controls over competitive practices and in some cases establish bona fide monopolies. All this the New Deal has only brought into the open. While the establishment of code authorities under the National Recovery Administration may have stimulated inter-business organization with its inherent dangers, it is also perfectly clear that many of the practices which have become better known since the organization of the National Recovery Administration have long been prevalent. If they are to be regulated or abolished they must first be frankly recognized. It must also be recognized that under the existence of legalized monopoly or combination the protection of the consumer must be found some place else than in the automatic workings of the competitive system. There has existed among the leaders of the New Deal a general recognition of the fact that the consumer must be protected.

The most clear-cut evidence of the existence of a general consumer interest within the New Deal is found in the program of the Tennessee Valley Authority. Historically, the electric power industry has been recognized as a public utility. It has been under the jurisdiction of state commissions. But the formulae under which these state commissions have functioned have been of such a character that it has been impossible to protect the consumer. The primary rule has been to regulate the public utility so that the owner may receive a fair return on a fair value of his property. I do not need to emphasize to this group the extent to which such a formula is inconsistent within itself and fails to take into account the consumer interest. Hence, I stress the fact that the program of an electric power rate "yard stick," such as is being worked out under the Tennessee Valley Authority, is a major recognition of the tremendous consumer interest involved in this particular industry. The Tennessee Valley Authority has recognized the consumer interest in many other ways. There is an attempt to develop a sound housing program, "proper" relationships between industries, the "proper" allocation of lands to industrial and housing purposes, an educational program, and the development of public health activities.

A second evidence of the consumer mindedness of the New Deal lies in its recognition of the problem of relief. In the past two years the community at large has become more aware of the tremendous unsatisfied needs of a large section of our population than at any other time

in the history of the Nation. We are all appalled as we face the periodic release of figures from the Federal Emergency Relief Administration stating that there are 15 or 16 or 18 millions of people receiving Federal relief. The fact of the matter is, however, that apparently in the past tremendous numbers of our people have needed relief but their need was never known or recognized by the community at large or by the Government, except in a sporadic way.

Another evidence is the support given the cooperative movement. The act of Congress which made possible the establishment of cooperative production credit associations was a definite forward step. It was bolstered by the Executive Order which provided that consumer cooperative organizations should not be discriminated against because of their cooperative form under codes of fair competition approved by the National Recovery Administration.

Still another evidence of the New Deal's interest in the consumer is the three bureaus within the Government which have carried the name "consumer" as part of their titles. These are the Consumers Division of the National Emergency Council, the Consumers Counsel of the Agricultural Adjustment Administration, and the Consumers Advisory Board of the National Recovery Administration. Each has been concerned with a different group of consumer's problems.

The Consumers Division, focusing through the Adviser on Consumer Problems to the National Emergency Council, has developed a program which has potentialities. A small group of approximately 150 so-called "county consumer councils" scattered over the country has been established on an experimental basis. They may consist of a half dozen people, picked from a community because of their recognized ability as representatives of the public interest, or as many as twenty-five or thirty or forty individuals, chosen as delegate representatives of existing community organizations. The program of these councils has been as varied as the individuals participating. To a certain extent the Consumers Division staff in Washington has guided the activities of the various Councils but usually the local group translates any suggestions from Washington into its own varieties of activity. There has never been any agency in the government which has brought together information existing in other government bureaus which is valuable to consumers. The Division is not looking for any job of running these various bureaus but it is concerned with bringing them closer to the community at large.

The Consumers Counsel of the Agricultural Adjustment Administration came into existence because it was recognized that the program of the Agricultural Adjustment Administration can be carried

on adequately only if due consideration is had for the consumer. It was recognized that the processing tax method of financing benefit payments to farmers for cooperation with the adjustment program was in major part a tax on the consumer for the benefit of farmer producers. This tax was justified on two grounds by the Administration. First that the farmers had in a sense been "taxed" for the benefit of consumers for over a decade in the low prices of farm commodities relative to the prices for industrial goods. The second justification for the program was the conviction that the productive machinery of both agriculture and industry in the country at large would function more smoothly if a more equitable balance were established between the prices of industrial products and the prices of farm products. One of the functions of the Consumers Counsel was to see that the processing tax was not pyramided.

The recognition of the consumer is implicit in the stated purpose of the Act which was to establish a balance between production and consumption of farm products. The latitude given the activities of the Consumers Counsel of the Agricultural Adjustment Administration has rested on this broad statement of policy. The weaknesses of the Consumers Counsel go back to the fact that it is a part of an administrative agency concerned primarily with an agricultural production control program. However, both the Secretary of Agriculture and the officials of the Agricultural Adjustment Administration have indicated, both in their official statements and their actions, a genuine concern for the problems of the consumer and a frank recognition that pushing a restriction program too far would harm not only the consumer but also the producers of agricultural commodities.

In addition to these publicity activities, the work of the Consumers Counsel consists of economic analysis of the functioning of the various phases of the agricultural program from the standpoint of the consumer and participation in drafting and reviewing of marketing agreements. These agreements are somewhat akin to codes of fair competition. The Consumers Counsel has insisted that such arrangements between marketing groups should not be used to the disadvantage of the consumer or the farmer. If the consumer is to be adequately protected it should be recognized that there should be no discrimination in favor of one group of farmers at the expense of another. In a program which creates economic opportunities which can be exploited by organized special interest groups the need for eternal vigilance is apparent.

The activity or seeming lack of activity of the Consumers Advisory Board of the National Recovery Administration has at times been

sharply criticized. It is an interesting commentary on the attitude of the National Administration that under the Act which has been directed primarily with an eye toward the basic industrial groups of the country, the consumer should have been recognized at all. In weighing the Administration's attitude toward the consumer under the National Recovery Administration it is essential to distinguish between the broad theory underlying the National Industrial Recovery Act and the activities carried on under the National Recovery Administration. The theory behind the Act seems to have been that under modern business conditions insufficient purchasing power was paid out by the business machine to enable the producers, acting as consumers, to buy back the goods which they have produced. Hence, by increasing wages while shortening hours, increased purchasing power would be in the hands of these producers as consumers thus enabling them to buy back the products of their industry and start the upward spiral of business recovery. I am not concerned here with the soundness of this theory but with its implicit recognition of the significance of the consumer. The emphasis on the impractical character of many of the price-fixing devices under codes of fair competition and the necessity for constant recognition of the consumer interest if the codes are not to become self-defeating has become more and more evident.

The Consumers Advisory Board has given most of its energy to a critical analysis of the various codes which have been approved by the National Recovery Administration. The regulations of the Administration require that staff members of the Consumers Advisory Board shall participate in the negotiations and make available to the various deputy administrators who are directly in charge of the process of negotiating codes, the opinions of the Consumers Advisory Board regarding the way in which any particular code will function. The opinions of the Consumers Advisory Board appear to receive more friendly consideration today than at any previous time.

In a business economy, the first concern of any consumer organization will have to be prices. There will have to be a consideration of price making mechanisms, the inter-relationship of prices within the price structure, the extent to which prices are fair from a consumer standpoint, that is to say, at a level which will enable consumers to buy, and so on. The second major concern is with establishing the bargaining position of the consumer. Adequate and effective competition is important in this regard in some industries. In other industries buyer's representation on code authorities would be helpful. In still others such as the electric power industry public competition

would be helpful. Of equal importance is the establishment of adequate standards and grades for consumer goods which will be labeled in such a way that the consumer can know what he is buying.

The scope of the point of view which I have suggested as the genuine consumer attitude within the New Deal is still narrow. Whether it is to be broadened and take a more permanent place in the picture is too early to state. As with the general development of the New Deal, the fate of the consumer movement lies in the hands of the great mass of people as they express themselves, both through their direct contacts with the Government and in their judgment on the New Deal at the polls.

CODES AND THE CONSUMER

By Willard L. Thorp

The National Industrial Recovery Act contains only two references to the consumer. One of the stated purposes in the Act is "to increase consumption by increasing purchasing power". And among the provisions is the delegation to the President of power to impose conditions on any code for the protection of consumers.

In theory, the Act as originally conceived, at least on the part of some who claim paternity, was by no means anti-consumer. It was built upon the expectation that volume would increase, not so much through Title I as Title II, the Public Works Program. This increase in volume by reducing the per unit overhead cost would permit increased wage payments without imposing a burden on the consumers. Furthermore, a closer definition of the plane of competition might eliminate certain of the more wasteful competitive practices, and some of the resultant savings hopefully might accrue to the consumer. Finally the code procedure represented a new and possibly fruitful approach to the perennial problem of monopoly and monopolistic practices.

With these laudable possibilities for consumer benefit in mind, it became necessary to provide some means of assuring that the codes were not packed with provisions costly to the consumer. And so certain elements were introduced into the procedure to provide for consumer protection. First was the device of public hearing. Second was the establishment of the Consumers Advisory Board. The defects in both these forms of protection need little elaboration. Not only have interested parties failed to appear at public hearings and present their case, but the continuing negotiations after the time of public hearing and prior to final approval of the code have been limited all too frequently to the Deputy Administrator and the industry's code committee, without continued participation by the other interested parties. Furthermore, there is no assurance that the advice of an Advisory Board will be followed. In fact it is not an unusual human reaction for advice to be resented.

In considering the operation of the Consumers Advisory Board, it is important to note that NRA procedure is for industry to submit a proposed code or amendment. Consequently, discussion turns about the suggestions put forward by business men themselves. This throws the Consumers Advisory Board continually on the defensive,

endeavoring to eliminate or modify provisions which it feels are harmful. This fact, more than any other, has led to the conviction in some quarters of the ineffectiveness of the Consumers Advisory Board, because its positive contributions are not yet numerous. But in fact, the great bulk of its activity and its victories lie in preventing provisions from slipping through which cannot be justified in terms of public interest. Such activity does not make a glittering public record, but it nevertheless has been very real.

The influence of the Advisory Boards has been increased by the establishment of the Advisory Council. Not only are there consumer representatives on the Council, but the Consumers Advisory Board is able to lift any matter out of usual administrative routine and bring it before the Advisory Council, where it is examined and a recommendation made to the National Industrial Recovery Board.

Also, to complete the record of devices for protecting the consumer, there should be noted certain exhortations addressed to industry by both the Administrator and the President. I refer particularly to the plea that prices not be advanced more than necessary to meet increased labor cost.

But the test of these various gestures is to be found in the code provisions themselves, and in their operation. For the purpose of this analysis, I shall consider only four fields—volume, prices, information and inflexibility.

The consumer is, of course, greatly concerned with any restrictions on volume. Standards of living are not composed of cash but of goods and services. Curtailment of volume is contrary to the consumer's interest, unless it promises results of clear benefit in terms of economic health.

First, consider the codes which have provisions affecting capital investment in the industry. One code, iron and steel, flatly forbids the extension of pig-iron or steel ingot capacity until the code is amended or the President suspends the provision. About twenty codes require that authorization for new capacity be obtained from the Administrator, the most important industries with this type of provision being cotton textiles and ice. Such authorizations have been granted to one cotton textile company, one lace manufacturer, one throwing plant and one glassware plant. In the glass container industry, a recommendation for denial by the Code Authority was reversed by the Administration. In the case of ice, at first applications for new capacity were denied, the latest being September 21, 1934. Since then, every application has been granted. In one in-

stance, the excelsior industry, capacity control was discontinued on September 19, contrary to the petition of the industry.

Coming to specific production control, in but two codes, lumber and petroleum, a direct form of allocation is in operation, and in copper, sales are allocated. Two codes, carpet and rugs and carbon black, limit the accumulation of inventory.

There is therefore little direct production control. However, indirect control is imposed in a number of cases by machine and plant-hour limitations. Twenty-one codes limit operations to two shifts and twenty-two codes, to one shift per week. Thirteen codes do not specify the number of shifts but rather the total hours, six of which are obviously on a single shift basis. By far the greatest number of these codes are in branches of the textile industry. Under present conditions of demand, these restrictions do not result in any serious limitation of output, though they do result in a more equal distribution of activity throughout the industry. The harm is not so much an immediate one, as the danger of continuing the restrictive policy into a period of rising business, when it might have all the unfortunate results to the consumer of a protective tariff.

The same line of argument runs to the fundamentals of the labor provisions, of course. Limiting the hours which individuals may work, is not in itself a serious curtailment when there is widespread unemployment and plants are operating far below capacity, except as higher prices arising from increased labor costs may reduce demand. The problem that is more serious is that of determining a proper policy, if and when demand increases beyond the capacity to produce under the labor restrictions. However, this is not an immediate problem pressing for solution, so I pass it by with this brief mention.

Turning to the field of prices, the record of the codes is even less reassuring. Business men wrote into code after code, at least 350 in all, provisions relating to price determination, minimum price floors and "cost recovery". In most instances, the provision has never gone into actual effect, since it depended upon the approval of a cost accounting formula, and such approval has been given in less than 40 cases. Perhaps the most hopeful signs in recent months have been: the adoption within NRA of a policy against the further granting of such privileges in new codes or through code amendment, the withholding of approval of cost formulae, the abandonment of the price-fixing experiment in rubber tires, the lumber industry and the waste paper industry, and the announcement by the National Industrial Recovery Board of a general hearing beginning January 9th, on the whole problem.

The experience of NRA has emphasized the many elements that enter into the process of purchase and sale beyond actual transfer of cash. Such factors include time, quantity and special discounts, advertising allowances, guarantees against price declines, assurance against cancellation of contracts, limitation on forward contracts, premiums and free deals, regulation of trade-ins, the sale of seconds, combination sales, classification of customers, and a host of variations. These practices may all have their place, but under the competition in buyers' markets have frequently been extended far beyond any reasonable function or service. In general, the codes may have a proper function in placing limits on unreasonable extensions of these practices, but the place of drawing the line is not always clear. The Consumers Advisory Board has insisted that that market is most healthy in which individuals are left wide freedom to determine the type and character of terms and conditions of sale.

Turning to the field of information, I wish to discuss statistics and standards. The consumer is interested in records, both that he may buy wisely and that he may judge the behavior of the industry. So far, the performance of the NRA has not been at all satisfactory in this field. The Act gives power to require reports. Many of the codes have similar provisions for collection of statistical data. But the hope that was raised so high in the hearts of many of us, that at last we would have a real statistical picture of economic processes in operation, is still deferred.

In the field of standards, likewise, one must report only slight progress. To be sure, about 40 per cent of the codes lay down some definite specifications as to quality, quantity, sizes, weights and measures, adulteration, use of second-hand materials, labeling, and the like, or contain provisions for continuing study of the possibility of applying standards to be set up in the course of administration of the codes. More than fifty codes make reference to standards set by, or to be formulated in conjunction with, some specified agency such as the Bureau of Standards. In certain instances, standards which have had voluntary use in the industry, now become mandatory through inclusion in the codes. Nearly forty codes contain provisions relative to marking, labeling, classifying or grading, and the like. Nevertheless, the provisions in these codes by and large represent merely the codification of existing practice, rather than any considerable extension in the providing of information to consumers. Much of the Consumer Board activity has been to prevent inadequate and abusive practices from parading under the name of standards.

The fourth and last category is inflexibility. The consumer de-

sires an economic system so flexible that new processes and new methods can readily be introduced. However, many business men, in drafting codes, had the purpose of preserving or even extending the scope of their particular industrial group, or preserving a practice which progress might threaten. The system of multiple codes has contributed to the dangers of rigidification. The most troublesome problems arise in the field of distribution. Certainly it would be most unfortunate to introduce inflexibilities into that branch of our economic life such as to delay reorganization and improvement along lines consonant with the consumer's interest.

All this talk about code provisions is essential, but it is only the beginning of the problem. Code provisions and actual practice may vary widely. As to existing practice, all too little is known. The fact that code authorities are usually made up almost exclusively of members of the industry, and that the so-called "administration members" are all too frequently absent or inexperienced, has created a situation which is extremely difficult to evaluate. This much can be said, that what deviations may exist in practice away from actual code provisions are usually in the special interest of the industry. In less than half a dozen codes, there is a consumers' representative on the code authority. In other cases, the administrative member has a consumer adviser, but he is thoroughly insulated from the heart of operations, if the administration member proves to be a non-conductor.

A further point to be kept in mind is the reliance upon industry to police its own fair trade practices. This rests upon the assumption that the majority of the industry desires the regulation, and have long hoped for a way of bringing a recalcitrant minority up to the higher place of ethics of the majority. This undoubtedly holds for many trade practices. Nevertheless, it can hardly be expected that the same interest will prevail in enforcing provisions which are essentially for the protection of the consumer. When the interests coincide the problem does not exist. But in other cases, it is very much with us.

I should also note the possible indirect results of the development of close-knit industrial organizations. Industries have been brought together around tables and behind closed doors which have never met together before. They now have a code authority, and a headquarters. The opportunity is presented for concerted or collusive action.

Should the consumer urge that codes be scrapped? I think not. There is real promise in the procedure. And what is the alternative?

But the present situation is by no means satisfactory to the consumer interest. The consumer should strive to achieve certain ends:

1. *Code revision.* At present, differences in codes are essentially chronological. Codes must be revised in the light of clear-cut policy leading either to:

(a) Sharpening the old protections of competition, or

(b) Administration in the public interest

Those industries where it is possible to expect the protection which competition can provide, may well be relieved of elaborate codes, and keep only labor provisions and such few trade practice provisions as are already sanctioned by the Federal Trade Commission. Such industries hardly need a code authority. Other difficult economic situations, where more drastic action is necessary, should be dealt with on the basis of providing that as the industry is given privileges, it must accept more supervision. And it must be effective and intelligent supervision.

2. *Enforcement.* As long as the responsibility for administering fair trade practice provisions is left almost entirely for industry to enforce, the consumer will gain little, even though code provisions appear to benefit him.

3. *More light.* The consumer must press for greater information about industries and for review and observation of the operation of code provisions. Experience must be made to count, as it evidently has in connection with price determination.

And so, I suggest that the consumer need not entirely despair of the NRA. Its potentialities are still present. There is a real social gain in defining closely the plane of competition. And present trends in terms of revision of codes appear to be distinctly encouraging.

There are two ways of approaching a goal. One is to do it carefully, considering every step with great care, and building slowly and securely. The second is by a series of approximations, expecting a large error the first time, but by a process of continued correction reaching the goal in the end. The NRA seems to me to have attacked the problem in the second manner. The first shot was necessary to deal promptly with the disintegration of labor markets. The provisions other than those relating to labor were based chiefly on proposals by industry, somewhat modified in the light of other interests. Now the revision process is under way. The distance from the goal may still be great. But optimists like myself may still hope that the correction process will bring us there eventually.

COSTS, PRICES, AND THE CONSUMER

By Henry B. Arthur

The recovery program has placed the consumer in a key position through its emphasis upon purchasing power. This approach should probably be tied up with an underconsumption theory of the business cycle. It was felt that one of the greatest needs for recovery was an expansion of the ability of consumers to buy goods.

By underconsumption is meant not merely the counterpart of overproduction and accumulation of stocks. Underconsumption is also manifested (in non-agricultural industries) in the unemployment of workers who are "under-consumers" because they have no source of income.

This expressed policy of restoring purchasing power took form, first, in a tremendous increase of Government spending and, second, in an effort to rearrange economic elements and relationships in such a way as to stimulate consumption. The consumers who received preferred recognition were the unemployed worker, the employed low-paid wage earner and the farmer.

The NRA was aimed chiefly at increasing the number and the incomes of wage earners. The specific action took the form of a raising of wage rates and a reducing of maximum weekly hours per worker. In the early phases of the program it was urged upon business men that they raise prices only to the extent that it was made necessary by increased labor costs, although it was granted that the Government was not asking industry to continue selling at prices which might have fallen to distress levels.

The program of the AAA made use of much more direct methods than this reliance upon a relative inflexibility of other costs while wage rates were arbitrarily boosted. Here the aim was to increase the total income from an industry rather than to increase the share of that income which went to a special group, such as labor. The method used for increasing the income was a price-raising scheme based directly upon a restriction of supply. This income was also to be augmented by rental and benefit payments which were used in turn as inducements to producers to restrict their output.

The success of the NRA relied in considerable part upon the increase of output with price advances held to a minimum. The success of the AAA, on the other hand, was contingent upon a successful contracting of production and upon the expected consequent

increase in prices. In order to observe what the net effect over the past year and three-quarters has been, I have made an examination of statistical information which I believe to be pertinent. It must be first admitted that statistics necessary for forming a judgment as to the well-being of consumers are very meagre indeed; especially for such elusive but important factors as retail prices, changes in the volume of goods moving into consumers' hands and studies of the breakdown of retail prices into the margins and shares which go to various agencies which have produced and distributed these goods.

Any detailed examination of industrial costs seemed entirely futile on the basis of available statistics, since costs to be useful had to be related to specific prices, and only a few observations of this sort are possible. Moreover, one cannot rely solely upon costs in appraising the fairness of prices, because costs are only one of many elements affecting prices. Another element which makes costs a poor guide to price, is the volume of production. Many industries approached the recovery administration with the doctrine fairly well developed that all costs should be recovered in the price of the product and that this principle should apply whether a plant was operating at a rate that utilized only one-half of its capital equipment or that would tax its full capacity. Many industrialists considered recovery as analogous to the elimination of red-ink entries, and they proceeded by direct steps toward the cure. Any widespread acceptance of this doctrine would have very serious results indeed for many industries. It would have been especially marked in building materials and supplies where operations had fallen to 25 per cent of 1929 rates or lower. But these cost problems were related to specific codes and it is my purpose not to discuss codes but to consider consuming power.

It is desirable specifically to test whether price increases for industrial goods have represented an exploitation of the wage earner. From this point of view costs may be treated in a different way; they may be represented as shares in the return from the sale of products. We must be mindful that this share is that derived from the sale of a single unit of the product—it ignores the effects of changing volumes of sales—and that we are referring to the income of the working man which is derived from each unit of the product sold. It is independent of any spreading among several workmen of the work which was formerly done by a single individual.

With a view to finding out whether a major part of the increased income per unit of product (indicated by price increases) went to the laborer, who is the largest consumer group among those receiving

shares, computations were made showing the comparison between the per cent of increase in hourly earnings and the per cent of increase in prices in important industries since March, 1933, which was selected as a date generally near the low point for both series. The results show an increase of approximately 30 per cent in average hourly wage payments in manufacturing industries compared with an increase of approximately 18 per cent in the wholesale prices of all commodities other than farm products and foods. This difference between 18 per cent and 30 per cent seems greater than would be explained by any general increase in productivity per man hour or by the other necessary qualifications of the data. Apparently other costs were not increased as rapidly as wage rates, and we may, therefore, conclude that labor enjoyed a greater "improvement ratio" than did the sum of the other income sharers. There are apparently enough inflexible cost elements so that an advance of hourly wages was not accompanied by a *pari passu* increase in prices.

If each cost factor increased by the same percentage as did the price of the product there would be a proportionate distribution of the increased returns. If one element rose more sharply than the price, some other element must have risen by a smaller percentage, or perhaps actually declined, since the weighted average of the percentage increases going to the various sharers (including the entrepreneur) equals the increase in the total price. It would be extremely valuable to have measures of the per cent increase in the return to other factors of production besides labor, but comprehensive data of this sort are not available outside the Census of Manufactures, and there they are not up to date. Other scattered figures have been prepared for certain individual plants, but these give no representative picture.

Examining the list of individual commodity groups for which comparable data could be secured, it appears that the average situation of an hourly wage rate increase exceeding the price increase applies in most of the non-food industries, with the notable exception of a few industries like petroleum refining and copper smelting. In these two industries a large increase has occurred in the share going to the producer of raw materials which came from badly depressed natural resource industries.

The excess of wage rate increase over price increase is especially striking for such industries as bituminous coal, men's clothing, boots and shoes, and similar industries where wage rates were advanced considerably by the code. Here wage increases were much sharper than price increases.

There is unfortunately no conclusive statistical proof, but this situation of increased hourly earnings probably differs from the situation in the early phase of other recoveries. The more general experience has been the holding down of hourly earnings until there has been a considerable absorption of the unemployed. The significance of this situation is discussed below.

So far we have considered the sharing of a price per unit of product. If there had been no change in output and no change in employment, this might have been enough to indicate that the groups of income receivers who needed it most had shared most in the price increases which had occurred.

But it will be objected that we are talking in terms of hourly wage rates and not in terms of pay envelopes. The NRA wage rate increases were accompanied by a shortening of hours. What effect did this have?

The evidence afforded by the figures of the Bureau of Labor Statistics indicates that the average employed worker in manufacturing or commercial lines did not get an increase in his weekly earnings commensurate with the increase in the average cost of living. What the figures show is the result of a program for spreading the work. Average hourly earnings did rise more than the cost of living, but presumably the shorter hours were keeping more people at work than would otherwise have been employed.

The average employed laborer has made a sacrifice in the interest of spreading the work. Admitting this, however, it is fair from the national viewpoint to consider consumers as a whole. For this purpose we should look at income figures pertaining not to individual wage receivers, but to total receipts of all workers. These are revealed, not in average weekly earnings, but in payroll totals. Here we find payrolls definitely exceeding the increase in the cost of living, indicating an increased ability on the part of wage earners as a whole to consume.

It is interesting to note that as a net result of the increase in hourly earnings accompanied by shorter hours the relationship between the curves for manufacturing payrolls and employment is very similar to that which obtained after the bottom of 1920–1921 depression. Payrolls were not rising faster than employment until after the middle of 1922, although employment had been increasing for nearly a year. Wage rate increases in the earlier case apparently began only after a considerable rise in employment. In 1933–34 the relationship is of the same sort except that wage rates have been

increased but the pay envelope is kept down by the shortening of hours worked.

In the course of a normal recovery I believe we should expect to see payrolls beginning to overtake the increase in employment, as a sign of a recovering labor market. In the present instance there is no reason why the same statistical phenomenon should not develop, although it would result from an increase in the number of hours worked per week instead of, or in addition to, an increase in hourly wage rates.

To the extent that this difference does exist it means that we have already seen the mark-up of hourly wage rates or wage costs, and that the next step will mean a fattening of the weekly pay envelope through increasing the time worked rather than by increasing the wage cost per unit of product. It would be too much for consumers to hope that this might mean that further industrial recovery might come without further increase in prices of industrial products, but there does seem to be a possibility that some of the effects of wage rate increases which usually have their effect later in the cyclical recovery may have been in part accomplished already. This is no forecast, surely, that industrial prices can be expected to retain the stability they have shown during the past year; it is, however, one small factor acting in that direction.

Space does not permit a detailed discussion of the other elements in the analysis of the record of the past year and a half. The very considerable increase in farm incomes, augmented by rental and benefit payments, the increase in consumer purchasing power through relief payments, the indicated increase in consumer use of installment credit, have all been reflected in a considerable expansion of the amount of goods sold at retail. The last quarter of 1934, in particular, shows fairly clear indication of a substantial increase in the physical volume of goods moving into consumer hands.

The consumer is better off, it seems, than he was at the bottom of the depression. He has been so neglected statistically that it is impossible to know yet whether the Government's concentration upon him has given him a better deal than he has received on earlier occasions of business revival.

ECONOMIC EFFECTS OF WAGES AND HOURS PROVISIONS IN CODES

By T. O. Yntema

The effects of setting maximum hours and minimum wages under codes are by no means easy to trace. Not only are the data fragmentary, but the observable phenomena are affected by a multiplicity of causes; by changes in the banking system, reduction in the gold content of the dollar, heavy government expenditures, limitations of agricultural output, and a shift in psychology, as well as by measures taken under the NRA. Only to a limited extent can the effects of the NRA be established directly from the statistics; for the most part it is necessary to resort to less direct economic reasoning to appraise the consequences of the code provisions.

In analyzing the results of the minimum wage and maximum hour specifications in the codes, it will be convenient to simplify the problem somewhat arbitrarily by dealing successively with the following phases of these results: (a) sharing the work; (b) the direct effects of higher wage rates in redistributing incomes; and (c) the effects of hour and wage provisions on recovery.

Codes have limited the work week to a maximum in the vicinity of 40 hours, with variations above and below in individual industries and in different groups within an industry. At present levels of production, the current average working week of wage earners in industries under codes is some 5 hours shorter than it would be without such mandatory maxima. At lower levels of output the net effect of these maxima would be less; at higher levels they might reduce the work week by as much as ten or twelve hours below what it would be in the absence of control.

If we take the existing volume of business activity as given, and neglect the influence of the NRA on this volume, the sharing of work through shortening hours has caused the employment of approximately 2 million additional wage earners. In other words, roughly half of the reemployment achieved since March, 1933, has come through sharing work and half through increased output.

It is interesting to inquire who provided the real incomes of these 2 million additionally employed wage earners. If wage rates had not been advanced under codes, sharing of work would also have necessitated sharing of weekly earnings, and thus the shouldering of a large burden of relief. The incomes of those already employed in

industries under codes would have been reduced on the average by some 12 to 15 per cent and the possibilities of their earnings being enhanced through a longer work week with the return of prosperity still further curtailed.

But the combination of wage rate increases with hour limitations shifted the incidence of this burden. Although the data are incomplete, and I have not been able to make an exhaustive study of available materials, I should estimate roughly that the average hourly wage rate was advanced under codes some 25 per cent, and in manufacturing industries by somewhat more than this. These increases have been sufficient to compensate approximately both for the loss of income from shorter hours and for the increase in the cost of living. Therefore (assuming total output not to have been affected by wage and hour provisions) the incomes of the 2 million additional wage earners reemployed have been provided not by those who shared the work with them, but by a reduction of the purchasing power of workers not under codes, salaried employees, farmers and other recipients of incomes not raised by codes.

These generalizations, it should be noted, are based on average figures; individual cases show departures from the average. Wage rate increases and hours reductions were not uniform over all industries and over all strata of labor. In particular, the lowest paid wage earners usually received the largest relative increases in rates. Consequently there were many groups of workers who fared better than the average under codes, and many who fared worse than average and who thus helped to foot the bill.

Let me emphasize that the foregoing statements are based on the assumption that the total volume of business activity has not been greatly enlarged or diminished by the NRA wage and hour provisions. It now is pertinent to investigate that assumption.

To date, the code changes in wage rates have had greater influence on the course of recovery than the shortening of hours. With large reserves of unemployed, a moderate reduction in hours by itself serves to spread the available work without seriously affecting labor cost per unit of output. Of course a drastic reduction in hours, such as is contemplated by the 30-hour week, would be apt to entail serious technical diseconomies; and even existing hour limitations would, as maximum employment is approached, prevent full utilization of our productive resources. But in studying what has transpired thus far, we may concentrate our attention on the influence of wage rate increases on recovery.

As a first approximation in the analysis of monetary flows, Keynes

and others have pointed out that higher wage rates have two compensatory effects—an increase in costs and prices, and an increase in incomes. If all increments in money incomes were spent on the products whose costs and prices were raised, there would be no inducement either to expand or to restrict production. The careless claim that increases in money incomes from higher wage rates are net increases in total purchasing power is obviously fallacious; this would be true only if prices did not rise.

Accepting Keynes' analysis as a first approximation, we must inquire into the less obvious second approximations. It is sometimes argued that total purchasing power is enlarged by higher wage rates and higher prices, since recipients of incomes from interest, salaries, and other sources, not augmented by code action, will spend a larger proportion of their incomes on consumption. This argument is sound as far as it goes—but it fails to take into account the reductions in investment expenditure caused by codes, the decrease in government relief due to reemployment, and also the diversion of increased wages to payments of debts, to building up larger working balances, to other savings, and to the larger expenditures for rents and other services and goods bought from the (relatively) fixed income groups. Weighing all these considerations, it appears likely that the net result of increased wage rates is to raise costs more than expenditures—and so restrict production.

Wage increases have an immediate impact on costs; but the demand for the products whose costs are raised is not immediately enlarged in corresponding amount. Wage increases under codes are by no means all spent directly for code products—a very considerable portion goes for other commodities and services, and returns only indirectly, and with a lag, to raise the demand for code products. As a consequence of this immediate impact of higher costs and the lag in demand, there is a tendency for higher wage rates and costs to result in a curtailment of output.

One other phenomenon in connection with monetary flows should be noted. If the increase in costs and price can be anticipated as in 1933, when there was two or three months' advance notice, there occurs a speculative shift from cash balances to commodities and equities. At least part of the boom in production in the spring and early summer of 1933 arose out of the efforts to take advantage of low costs prior to the PRA and the codes. If this spurt is to be credited to the NRA so also must there be charged against it the recession that set in as soon as the higher costs became effective. Whether the net resultant of the shift from cash balances to commodities by

entrepreneurs and speculators and the subsequent reversal after the higher price level was attained left any net benefit as compared with a more gradual, steady increase in output is a question to which we have no conclusive answer.

A high level of wage rates and prices in the industrial sector of our economy under codes is not conducive to recovery. The prospect of higher prices will induce entrepreneurs to make commitments, but the mere existence of a high level of prices only increases the burden of financial requirements, and where additional funds are not obtainable, limits the volume of operations. In general the lower the existing price level relative to the probable future price level, the greater will be the demand for capital goods. Certainly a price structure raised by artificially set wage rates does not offer particular inducement for investment. In this connection it may be observed that the indiscriminate boosting of wage rates under the NRA was unfortunate; if costs of producing durable goods had been held down, the purchase and production of such goods would have been made more attractive. Finally, the relatively high prices in the industrial sector or the large part of it under codes will divert expenditures into other services and commodities and into those industrial products which have a small proportionate labor cost, and experience, therefore, small price rises.

Furthermore—and this is important—the volume of employment is dependent on the relation of the wage level to the marginal productivity of labor or, more accurately, the incremental value of the marginal product of labor. Employers will not knowingly pay more than this unless compelled to do so by some monopoly labor group. Consequently, a raising of wage rates relative to the price of the product reduces the field over which it is profitable to employ labor and creates unemployment. The theory that labor can get an unlimited increase in its share of the total product of industry (without reducing that total or causing unemployment) simply by raising wage rates founders on this productivity fundamental. Unless compensated by monetary inflation the boosting of wage rates will continue to be a serious, if not insuperable, obstacle to the reemployment of the ten million now idle, and especially to the reemployment of the less skilled whose rates have been raised the most.

It is now a commonplace that the depression has been most severe in the industries producing durable goods. And this in turn is traceable to the relative unattractiveness of investment in such goods. The NRA has introduced some new opportunities for profitable investment through geographical and inter-industry shifts in the price

and wage structure; but the possibility that many of these shifts may be merely temporary dislocations makes them suspect to investors. The increased wage rates have also created some opportunities for the installation of labor-saving devices, but these have been limited both because of the increased labor costs of making machines and because of the higher operating costs per machine hour accompanying the shorter work week. Against these favorable factors must be set the constrictive effect on investment of a high price level supported by artificially inflated wage rates. Of still greater importance is the uncertainty regarding future government action on hours and wages under the codes. As long as such uncertainty prevails, and as long as profits are an invitation to wage increases, investment will be curtailed.

Even if, on all other counts, the effect of wage and hour provisions on recovery were evenly balanced, the monopolistic privileges obtained by industry as a *quid pro quo* in return for its assumption of the burden of higher wages and shorter hours would be sufficient basis for ruling unfavorably on such provisions. Although the feeling is growing that the grant of price and production control was in many cases unnecessary, the fact remains that such grants were tied directly to the labor provisions and their retention today is still excused as a protection to labor. In a few instances, such as the bituminous coal industry, labor and capital have combined to establish and maintain a monopolistic price for the product, which provides both an enhanced wage for labor and a better return to capital—all at the expense of the consumer. It is difficult to ascertain just how far the monopolistic tendencies under the codes have developed. Even if such tendencies have been temporarily thwarted by the rigors of the depression and by the vigilance and persistence of a few high-minded government officials, the full effect of combined action by business units in controlling production and prices and in securing special protective legislation will only be apparent with the passage of time.

One must recognize that fixed minimum wages can stop the downward spiral of lower prices—reduction in wages—still lower prices—still further reduction in wages—etc. The termination of a price decline by pegging costs will tend to ease the pressure of liquidation, to halt the scramble for cash balances, and to prevent some exploitation of labor by employers in monopoly buying positions. But in a depression, demand schedules are low relative to cost schedules. What is needed is an increase in demand; pegging costs will not cure the depression and may even accentuate it. And parenthetically it might

also be remarked that there is a vast difference between pegging wage rates to stop further price declines and jumping them back to 1929 levels.

A popular case can be made for the wage and hour provisions in the codes by dwelling on the apparent benefits and neglecting the less obvious, but not less serious, repercussions. Unfortunately such superficial argument is reinforced by sentiment, by wishful thinking, and by special union interests. If, however, the analysis is carried through to a careful examination of the repercussions, it leads to the opposite conclusion, that the wages and hours provisions under the codes have somewhat retarded recovery and are apt to hinder future improvement. A further large reduction in hours and increase in wages, such as is involved in the 30-hour week proposal, would be a still more serious obstacle to achieving prosperity. In contrast with such provisions there is much to be said for general minimum wage and maximum hour requirements which will provide minimum standards of decency without seriously interfering with our economy.

If our economic goal is first, a larger total output evenly maintained, and second, a more nearly equal distribution of income, then reducing hours and raising wage rates are poor devices indeed. We can go much further by reorganizing our tax system on a really progressive basis, by breaking up monopoly controls and freeing "sticky" prices, by providing for centralized control of credit and for safety of deposits in our banking system, and by the adoption of a government taxation and expenditure policy which tends to stabilize business cycles. For a further consideration of such measures I refer you to Henry Simons' pamphlet—"A Positive Program for Laissez-faire". Such proposals of economists may cut too deeply into vested interests to be politically palatable; but they do at least have the merit of marking out a sensible road for progress.

THE PROBLEM OF UNEMPLOYMENT AND THE CHANGING STRUCTURE OF INDUSTRY

By Ewan Clague

For about five years now this country has been suffering from an exceptionally large volume of unemployment. Neither the moderate business revival nor the extensive application of N.R.A. policies have brought about marked reductions. A vast program of government work for the unemployed is now being planned. But underlying nearly all the policies which have been initiated in Washington is the theory that the solution of the problem is merely a matter of time, that the present business revival will eventually create a demand for labor which will substantially clear the relief rolls and the government work projects of employable wage earners. What is the prospect that this will occur?

The thesis of this paper is that the chances are overwhelmingly against any such development during this coming prosperity period; that private industry will for a decade or so to come be unable to absorb the unemployed; that this failure will be due not so much to any lack of demand for labor by reviving business as to an unadaptable and maladjusted supply. At least, the chances are greatly against successful absorption by private industry.

What are the forces of demand and supply now at work in the labor market? Specifically, at what level of employment are effective demand and supply likely to be balanced in the years immediately ahead of us?

Demand for Labor—We seem to be on the road to substantial business recovery and eventual prosperity. The question is, what will be the nature of this present recovery? What factors will determine its extent and character?

Whatever else may have been accomplished by the devaluation of the dollar, and the Administration's monetary policy, there is one point on which practically all economists are agreed, namely, that a substantial rise in commodity prices is assured over the long term. When business recovery gets thoroughly under way and demand for business credit develops, the potentialities for credit expansion accompanied by rising prices will be tremendous.

The point about which we are uncertain is the rapidity with which this rise will take place. Should it suddenly break forth in an explosive expansion resembling the period of the war, the effect would

probably be to create a pressing demand for labor of all kinds. Unfortunately, such a rapid rise of a pronounced inflationary character could scarcely continue for more than a few years—hardly long enough to absorb all the unemployed before the inevitable collapse. Much more important from the employment point of view would be a slow creeping rise in commodity prices extending over a long period of years. If the monetary readjustments which have been made are balanced by the installation of checks upon expansion so that the effect of large metallic reserves works itself out over a long period, then the prospects would be most favorable for employment.

Many factories have stood idle for a long time, some for the entire five years of the depression. Tools and equipment have been permitted to rust or become obsolete. There must exist at the present time a tremendous potential demand for production goods which may express itself very suddenly. In private housing, very little construction has been done in five years, and improved incomes of workers' families should produce a considerable rise in the construction of private homes, even apart from any stimulation which the government might attempt.

Professor Ogburn in his recent writings, especially in *Recent Social Trends,* has emphasized the rapid rate at which invention is taking place in the modern world. He confidently expects this rate to increase, and the economic effects of inventions to be more pronounced. Invention, however, has a twofold effect upon the demand for labor. First, the invention may be labor-saving, leading to the displacement of labor and to consequent unemployment. This is the so-called technological unemployment of which we have heard so much during the depression. The present outlook is for the rate of displacement of labor to exceed the rate of reabsorption so that technological unemployment will continue to be large.

A second effect of invention, one very frequently overlooked entirely, is the displacement of capital. A new discovery which has the effect of making existing capital equipment obsolete, such as the new light speed trains on the railroads, can result in making necessary the complete reequipment of an industry, with a temporarily favorable effect upon the demand for labor.

The population of the United States, in the first decade of this present century, increased 21 per cent; during the war decade it increased 15 per cent, and from 1920–30, 16 per cent. Some recent estimates made by Thompson and Whelpton indicate that by 1940 the population will have increased to less than 132,000,000, a rate for the current decade of only about 7 per cent. After that, growth

will slacken rapidly until the maximum of about 140,000,000 people is reached about 1950. Even this estimate may be too high.

This change in the rate of population growth will have important consequences for labor, because of changes which it will produce in the demand for goods and services. A country with a rapidly-growing population is assured of a steady demand for the basic necessities of life. If there is little or no increase in population, and if economic progress expresses itself in a rising standard of living, then the demand for goods and services will be of a different type. Consider the effect of this upon the demand for automobiles, wheat, cotton, houses, amusements, vacations. American industry is bound to undergo great changes in structure as it adjusts itself to meet these changed demands. How many industrialists are there who have begun to make preparations for these shifts? If industry fails to make an effective adjustment, then it may be that business prosperity and the demand for labor will be curtailed over a long period of time.

The demand for labor, despite all these cross-currents, should rise fairly rapidly and be reasonably well-sustained. Factors which cannot now be forecast may intensify this demand to a fever heat, and other factors, such as the slackening in population growth, may dampen it down. Making these allowances, it would seem that unemployment in the future will not originate from factors on the demand side.

Supply of Labor—Population growth may be slowing down, but the number of gainfully occupied persons is not. The declining birth rates are giving us fewer children in the total population, but the number of people of working age has not yet been affected. Dr. Whelpton, of the Scripps Foundation, has supplied some estimates of the future population. He has further classified the population into the three basic groups, (1) urban, (2) rural farm, and (3) rural non-farm. Group (1) and group (3) have been added, excluding purely agricultural workers. The proportion of male and female gainfully occupied persons by age groups, as shown by the 1930 census, has then been applied to the Whelpton population estimates for 1935 and 1940. On the basis of these computations, the following estimates are made: 1930, 38,300,000 (actual); 1935, 41,300,000 (estimate); and 1940, 44,400,000 (estimate). These figures are based upon the assumption that the drift from the farm to the city will be about at the same rate in this decade as it was in the 1920's. This may not have been true in the first half of our present decade, but I would expect it to be so in the second half. Thus we shall have an increase in gainfully occupied persons by 1940 of about 6,000,000,

of which only about 2,750,000 is due to population growth. The 3,250,000 additional wage earners have been dug up, so to speak, out of the existing population.

The above figures are probably an underestimate of increase to the extent of several millions. The break-up of families which has occurred in this depression has put many more wage earners into the market. The 1930 census figures indicate that most working women are under thirty years of age, and that the proportion of women who work above that age is around 25 per cent. It seems probable that in the future a large proportion of the unmarried women and an increased proportion of the married women will be active in the labor market. The reduction in birth rate will increase the possibilities of job-holding by married women. Thus there may be as many as 5 or 6 million additional gainfully occupied persons, many of whom will be women.

It has been assumed that the agricultural population will remain constant, which means that its natural increase will be sent to the cities. But we may expect more than this. Many of our great staple agricultural products are being restricted in production. The cotton program has already had a marked effect upon the colored tenants in many sections of the South. One or more millions of workers (mostly colored) from the cotton belt are likely to be thrown onto the industrial labor market. This development may be hastened by technological developments in agriculture, particularly in the form of labor-saving devices.

One of the most important changes which is taking place, as a result of this increase in workers, is the change in the age structure of the urban working population. In 1930 a total of about 10,750,000 of the gainfully occupied were 45 years of age or over. By 1935 this number will have grown to about 12,250,000, and by 1940 to nearly 14,000,000. All these figures are based upon the assumption that the proportion of men and women working in the older age groups will not be raised. The sharp change which is occurring here can best be emphasized by a comparison with 1920, when less than 8,000,000 workers were in the age group over 45. Thus in a space of two decades, we may nearly double the number of older workers. This would indicate that the problem of the older worker in industry will be greatly accentuated.

Another characteristic of the labor supply which is of fundamental importance is the adaptability of the individual workers. During the depression, work habits have undoubtedly been affected to some extent. The training of new workers has been neglected. Lastly,

even when on the job, many workers get in a rut because of lack of training in any other job than the narrow one they hold.

How adaptable to new jobs are workers generally? Is the trend in industry toward the reduction of most jobs to the unskilled level, or is it toward more highly skilled jobs? There are two points of view in this matter. One holds that mechanization and industrial change have the effect of increasing the proportion of unskilled in the working population. If this is so, then adaptability becomes of less importance. There is another view which holds that the trend is toward greater specialization and a higher proportion of skilled workers, or at least of semi-skilled.

It seems to me that the development of industry *technologically* calls for increasing specialization, and that this makes it more and more difficult for a man to switch from one occupation to another. Of even more importance are the requirements of industry from an *organizational* point of view. Many workers who have the necessary requirements of skill are not sufficiently adaptable. Management will prefer to hire fewer men and pay them more rather than to expand the work force.

My suggestion is that the curve of labor productivity is a very sharp one, and further that it is becoming steeper with the changes in industrial organization. This means that high productivity and high wages for certain people could be accompanied by sweat-shop wages and unemployment for other workers. I question if the differential in the capacity of workers is at all paralleled by the present differentials in wage rates. If not, then unemployment of the submarginal workers, the unemployable, and the inefficient could exist along-side of an active demand for labor of the efficient, adaptable kind.

In the light of this brief survey of the characteristics of the labor supply and the probable demand for labor, what is the outlook for unemployment? My opinion is that the demand, even though active and strong, will be met by supply which will be badly adjusted to fit it. There may very well be a great shortage of labor of certain kinds, with no prospect of any shifting or adapting which will bring about an increased supply. But this will be accompanied by an actual surplus of labor in other occupations. I believe this present labor supply of ours is peculiarly unadaptable and untrained. It cannot respond to the opportunities which industry may offer. This implies a situation of great inequality—full employment, much over-time, high wages, and great prosperity for certain favored groups, accom-

panied by low wages, short time, unemployment, and possibly destitution for others.

There is another point which requires emphasis. If the wage structure should get out of balance because of this situation, it might have a dampening effect upon general business prosperity. We have heard so much about the lack of balance among commodity prices as a prevailing cause of the depression. Commodity prices which remain high in a period of general decline cause great reductions in sales, with consequent unemployment and general loss of purchasing power. Full production goes on only when the price structure has a reasonably good balance. This same analysis applies to wages. Shortages of labor accompanied by high wages in certain occupations may have a limiting effect upon total employment. Instead of solving the problem by bringing about a shifting in the labor supply, the high wages may merely accentuate the unbalance which exists.

Under these circumstances, blanket reductions in hours of labor will bring about very small and disappointing results in the form of increased employment. The solution for the problem cannot be found by desperately trying to provide opportunities for types of labor which cannot take advantage of them. It is possible that something could be done if a comprehensive program of training and retraining were to be instituted, if industry devoted its attention to increasing the adaptability of workers by shifting them from one job to another during their working career, if personnel managers improved their techniques of placement so that a larger proportion of workers were finally placed in jobs suitable to their qualities and characteristics. In other words, if both industry and the community were to devote some real attention to the analysis of the labor supply and to the improvement of it in the light of the needs of our industrial system, then we might expect better results.

Last of all, it must be recognized that this particular impasse is, of course, temporary. In time, everything will be all right—the surplus of older workers will be eliminated by age and death; the lack of training will be overcome by the influx of the younger generation; the maladjusted wage rates will be slowly brought into line. It is not intended to imply here that there will be a permanent labor surplus with consequent unemployment. This paper merely emphasizes the danger that during this trying period of readjustment, there is likely to be a heavy volume of unemployment which will require the attention of this nation.

TWO PROBLEMS OF UNEMPLOYMENT INSURANCE

By Paul H. Douglas

Should the insuring unit be a state-wide pool or should it be based upon separate plant or industry reserves? As is well-known, there is a vital difference between the Wisconsin plan which is based on individual plant reserves and the Ohio plan which calls for a state-wide pooling of reserves with merit rating for industries and firms after an initial period. As an intermediate form, industry pools are proposed by some.

One of the first features to be noted in connection with this problem is the fact that since the relative volume of unemployment differs so widely between industries and plants that if we use the plant or the industry as the reserve unit then one and possibly both of two consequences follow: (a) If approximately equal assessments are levied upon the various units then the benefits will be grossly unequal, and (b) in order to ensure equality of benefits there will have to be a great inequality of assessment.

Thus even within the same industry the amount of unemployment will vary appreciably between plants. When we come to differences between industries we also find sharp differences. As is well-known, a depression affects the capital or durable goods industries far more severely than it does those producing non-durable consumers' goods. This is well shown by Table I on the relative numbers employed in various manufacturing industries in February 1933 as compared with the average from 1923–1925 as 100.

TABLE I

RELATIVE DECLINE IN INDUSTRIAL EMPLOYMENT IN VARIOUS MANUFACTURING INDUSTRIES FEBRUARY 1933 FROM AVERAGE FOR 1923–1925 *

Durable goods		Relatively non-durable consumers' goods	
Industry	Percentage Decrease	Industry	Percentage Decrease
1. Lumber	67	1. Food products	22
2. Machinery	56	2. Paper and printing	20
3. Iron and steel	48	3. Textiles	28
4. Transportation equipment.	55	4. Leather	23
5. Cement, clay and glass..	62	5. Petroleum refining	24
6. Non-ferrous metals	55		

* *Statistical Bulletin*, Standard Statistics Company, April 1934, p. 47.

Even this table does not measure the full amount of the difference in unemployment since the employment figures for the durable goods

industries cover up a much larger amount of short-time than those for the non-durable. Furthermore, if we break these major groupings up into individual industries we find still sharper variations.

What is the import of these figures for a system of plant reserves such as that provided for in the Wisconsin act? That act provides for assessments upon employers of 2 per cent of the payroll until a reserve of $55 per employee is accumulated. According to present wage scales this would require on the average slightly over two years to accomplish even though the plant were to experience no unemployment at all. After the reserve reaches $55 per worker, the assessments are then reduced to 1 per cent upon the payroll until an average of $75 is attained when the assessments cease altogether.

When the reserves are drawn down to $45, then for each fall of $5 in the reserve the maximum benefits are cut by one-tenth. Thus, since $10 is the highest amount which can be paid weekly this means that when the reserves are at $45, the maximum weekly benefit is reduced to $9 and that when it falls to $40 the maximum is but $8. With an average reserve of $30 the highest weekly benefit is only $6, while at average reserves of $20 and $10 respectively the benefits are but $4 and $2 a week. It will thus be seen when the depression has reduced the reserves of a steel plant to $20 per worker its unemployed will only be able to receive benefits of $4 per week, while a flour mill with average reserves of say $50 will be able to pay the full benefits of $10 per week. Such an inequality of benefits as between workers who are equally innocent has nothing to commend it.

Another defense of the Wisconsin act has recently been advanced by Miss Elizabeth Brandeis.[1] Miss Brandeis declares that even if the strain upon separate company reserves would be unequal that the assessments upon the employers could be varied so as to provide approximately equal benefits and so that by a proper distribution of the unemployment costs between industries we could get a better allocation of productive energy. This might indeed be possible if the benefits were fixed and the contributions by the various companies were made so variable that each company could meet these obligations. But the principle of the Wisconsin act is precisely the opposite of this. It is the contributions which have a fixed upper limit of 2 per cent and cease altogether when a given reserve is reached. The employers are not responsible for anything more than this. This is grossly inadequate to meet the cost of unemployment benefits in such industries as automobiles, iron and steel, building, etc., and it

[1] Brandeis, Elizabeth, "Wisconsin's Start on Job Insurance," *The New Republic*, December 5, 1934, pp. 94–97.

is almost inconceivable that the maximum limit of contributions would be so raised as to enable the most irregular industry, to say nothing of the most irregular firm in that industry, to pay benefits which would be uniform with those in fairly regular industries. On the contrary it is the benefits which are varied under the Wisconsin act and which are cut down in order to permit the contributions to be fixed. Instead of charging the full cost of unemployment to an industry, the cost is charged to the workers in an ever-increasing degree as the relative volume of unemployment in a particular plant rises. The inherent structure of the Wisconsin plan, therefore, prevents the very distribution of costs which Miss Brandeis advocates.

The conclusion should, therefore, be clear that the unemployment insurance fund should at least be state-wide in nature and provide an equality of benefits as between the workers of different industries. Within these state-wide systems some cautious experiments in merit-rating may be indulged in after a sufficient trial period, in order to place some slight added stimulus upon employers and industries to reduce seasonal unemployment.

Because of differences in the relative volume of unemployment between states, a national re-insurance fund is needed to equalize benefits. Not only does the volume of unemployment very appreciably between plants and industries within a state but it also varies greatly between the states. This is well shown by the Unemployment Census of April 1930. If we take the total number of gainful workers attached to non-agricultural occupations and also the number of the unemployed in Classes A and B at that time, we find the percentages in Table II.

It will thus be seen that the relative amount of unemployment in April 1930 was almost precisely four times as great in the state with the highest percentage as in that with the lowest ratio. The two most heavily burdened states had unemployment ratios which were respectively 43 and 56 per cent greater than that for the country as a whole.

If we were to estimate the average percentage of unemployment for the four years from 1930 to 1933 inclusive by applying the statistics of employment to the bench-mark figure for unemployment in the spring of 1930, we would probably find that the average was somewhere between 25 and 30 per cent. The relative differences between the states would also probably be somewhat reduced and their positions would be somewhat changed, but it appears that the state with the highest ratio would show approximately twice as much unemployment on the average as the state with the lowest.

TABLE II

PERCENTAGES OF GAINFUL WORKERS IN NON-AGRICULTURAL OCCUPATIONS WHO WERE UNEMPLOYED (CLASSES A AND B) IN APRIL 1930*

State	Percentage unemployed	Ratio U.S.=100	State	Percentage unemployed	Ratio U.S.=100
United States	7.94	100	Wisconsin	7.23	91
Rhode Island	12.41	156	Vermont	7.19	91
Michigan	11.35	143	Missouri	7.15	90
Illinois	9.76	123	Louisiana	7.08	89
Montana	9.53	120	North Carolina ...	6.52	82
Pennsylvania	9.25	117	Idaho	6.42	81
Ohio	9.11	115	Wyoming	6.16	78
Massachusetts	9.05	114	Texas	6.15	78
Oregon	8.84	111	New Mexico	6.12	77
New Jersey	8.39	106	Arizona	6.10	77
Nevada	8.37	105	Arkansas	5.86	74
Indiana	8.31	105	Kansas	5.62	71
Colorado	8.10	102	Georgia	5.46	69
New York	8.03	101	Virginia	5.43	68
California	7.93	100	Alabama	5.36	67
Washington	7.86	99	North Dakota	5.32	67
Utah	7.77	98	Nebraska	5.29	67
Connecticut	7.73	97	Maryland	5.16	65
Florida	7.66	97	Mississippi	5.10	64
Maine	7.65	96	Iowa	5.02	63
Oklahoma	7.63	96	South Carolina ..	4.86	61
New Hampshire ..	7.57	95	Tennessee	4.82	61
West Virginia ...	7.50	95	Delaware	4.61	58
Minnesota	7.32	92	Dist. of Columbia.	4.35	55
Kentucky	7.31	92	South Dakota ...	3.12	39

* Data derived from Fifteenth Census of the United States, *Unemployment* Vol. I, pp. 96–1108. I am informed that the actuaries connected with the President's Committee on Social Security have also worked out percentages by states which show somewhat different results than these. The difference is probably due to differences in method. Thus I have not eliminated the self-employed among the non-agricultural groups while they may have done so.

It will thus be apparent that even with a system of state pools, equal contributions will give grossly unequal benefits. While on the average an assessment of 3 per cent on payrolls might be sufficient to provide for 15 weeks of benefit at 50 per cent of current wages subject to a waiting period of 4 weeks, this would not be possible in states with an appreciably larger amount of unemployment than the average. On the other hand, the states with an appreciably lower than average ratio of unemployment would show a comfortable unused surplus, were the benefits fixed at these figures. Assuming that these average benefits are approximately sound from an actuarial standpoint for the country as a whole, the second group of states could in fact pay on a more liberal scale.

It is obvious that from the actuarial standpoint the most effective system of unemployment would be one upon a national scale. If we are, however, to enact unemployment insurance on a state basis, it is highly important that there should be a national re-insurance fund which will help to equalize the benefits between the states. It could do this by coming to the aid of those states which though managing their funds efficiently were unable to pay an approved standard of

benefits because of an unduly large volume of unemployment. If, therefore, the federal-state plan of unemployment insurance does not contain a national re-insurance fund, we may expect a marked disparity of benefits between states to develop.

It is still uncertain as to how large a proportion of the total receipts should be segregated in such a national re-insurance fund in order to provide for an equality of benefits to result from an equality of assessments. There are two ways of making tentative estimates of this.

(1) A reserve for re-insurance which should meet the maximum strain would be for the Federal Government to turn over to each of the states only the amounts required by the state with the minimum amount of unemployment and to retain in the re-insurance fund the weighted average deviation of the various other state averages from this figure. On the basis of the figures for April 1930, this average deviation from the 3.12 per cent minimum for South Dakota amounted to 4.82 per cent or 154 per cent the minimum figure. If an assessment of 1.2 per cent were to meet the claim to benefits against the state with the lowest rate of unemployment this would call for a reserve in the re-insurance fund of 1.8 per cent. I may say, however, that tentative computations on the estimated average percentage of unemployment by states for the four years 1930–1933 inclusive indicate an appreciably smaller maximum national reserve. The average relative deviation from the minimum on the basis of these figures is somewhere between 65 and 70 per cent. Thus if an assessment of 1.8 per cent of the payroll were sufficient to meet the benefits in the state with the lowest relative volume of unemployment, the reserve in the re-insurance fund would need to be only 1.2 per cent of the payroll.

(2) In practice the relative size of the re-insurance fund does not in all probability need to be so great as is indicated above. For it will be noticed that the average for the state with the lowest unemployment is markedly below that for the states which are only a few places above it. No real damage would, therefore, be done if the national Government were to turn over to the states an amount approximately sufficient to meet the benefit claims in the state which was fourth or fifth from the bottom and to retain in the national re-insurance fund the proportionate amount needed to meet the added costs in the states with higher averages. This could be estimated from the average deviations of the states with higher unemployment ratios from the state which is chosen as the bench-mark. This would leave small pockets of surpluses in the few states with a lower average but these would not be large in their total amount. On the basis

of the 1930 data we might, therefore, select Iowa with an average unemployment of 5.02 per cent and the 44th state in ranking as the bench-mark. The average deviations from this were 2.97 per cent or a relative deviation of 59.2 per cent which we may treat as approximately equal to 60 per cent. For the four years from 1930 to 1933 inclusive the relative deviations from the 45th state were approximately 25 per cent. While any estimate is necessarily very rough and only approximate, it would seem fairly safe on the basis of these data to fix an initial reserve for the re-insurance fund amounting to 50 per cent of the amounts distributed to the states.

STATISTICS IN SOCIAL INSURANCE

By C. A. Kulp

In social insurance statistics have two broad and closely related functions. They are, using the expression in its broadest sense to include the entire purview of management, essential as administrative tools. Also and at the same time they provide a convenient and convincing method of education. For the administrative use executives have often no worthwhile substitute and as time goes on refinement of statistical method and the inevitable competitive pressure of other demands on public funds will both permit and encourage them to lean more and more on control through statistics.

The educative use of statistics is not limited to indicating the importance of passing new laws and setting up new systems. Almost the contrary. The highest standards of public service imply not only routine administration but continuous consistent reexamination of a system in the light of its postulates. Because of the scope of this paper and because in practice they merge and interact, the educational and administrative uses of social insurance statistics in the following discussion will generally be considered together.

Workmen's Compensation Statistics—We have in this country our longest experience and—in terms of our opportunities—our greatest statistical failures in the field of workmen's compensation. Workmen's compensation statistics, for those who look forward to other social insurances, are at once a warning and a consolation. They illustrate in broad terms what we ought to avoid. They hearten us by showing how much can be done under the inevitable handicaps of federated government.

The administrative uses of workmen's compensation statistics are principally: to prevent or minimize industrial injuries, to secure efficient treatment of claims, to assure speed and certainty of compensation payments including assurance of accuracy of rates and of reserves.

In a going system the principal sources of statistics are naturally found within the system. Workmen's compensation (except for longshoremen and harbor workers) is in this country almost exclusively a matter of state concern, and the standards of statistical information in this field vary widely.

State labor departments and accident boards provide information on such matters as accident numbers and rates, delay in payments,

amounts of compensation awarded. Insurance companies either singly or as associations do extensive work in accident prevention and derive their principal rate-making materials from accident data. The National Safety Council, a non-profit association of employers, insurance companies, state labor departments and others, provides admirable industrial accident data within its field. The function of the federal government is as yet principally to attempt to coordinate state and other efforts. There are, aside from those of the Interstate Commerce Commission, the Bureau of Mines and the Department of Labor samples in steel and manufacturing, no independent federal industrial accident statistics.

A fundamental defect of American industrial accident statistics is that they are not uniform between states. The Committee on Forms of the International Association of Industrial Accident Boards and Commissions for example complains that in 38 states compensation insurance companies must deal with a total of 397 compensation claim forms, ranging from a single form in one state to 33 in another. The accident report form of one state asks for the answers to 60 questions, its most modest competitor only 18. Nor is this heterogeneity of claim reports an isolated instance. Indeed only in the matter of accident reports have the states, cooperating with the American Standards Association, made even partial progress toward uniformity. Even when considered solely as material to be used in a single state, industrial accident statistics are not as useful as they should be. When they exit they are too often not used at all. It is particularly as a preventive device that they disclose in these days their greatest faults. The present standard classification of accident causes is based principally if not exclusively on the immediate or objective cause of an accident. There is nearly universal agreement that at least half of industrial accident causes are not reached by such an approach.

Unemployment Insurance Statistics—The uses of statistics, entirely apart from the particular plan, will be the same generally for unemployment insurance as for workmen's compensation, with two possible additions. These basic uses are to promote prevention activities, and to assure efficient speedy claim administration, claim payment and the safety of the fund. In addition, if we expect within the next decade a more or less complete social insurance plan, rounded out by old age and health insurance, an extra load of administrative duty will be imposed on the administrative machinery of the unemployment benefit system (as well as on each constituent system) in order to minimize fraud, administrative expense and overlapping. Also the

unemployment insurance machinery will probably be entrusted or geared with a system of permanent poor relief for those who have exhausted all other aids. For both of these additional purposes, statistical controls must be devised.

It is now almost a truism that our statistics in this field are principally those showing employment and not unemployment. Professor Douglas, Dr. Rubinow, the Minnesota Stabilization Institute and the Interstate Commission on Unemployment Insurance have all made their calculations of unemployment benefit costs chiefly on employment data. This is not a matter of choice—it is forced on anyone attempting unemployment calculations. Formal unemployment data in this country (apart from pure estimates) are generally of three types: (1) They represent purely local or special conditions, for example the excellent studies since 1929 of unemployment in Philadelphia by the University of Pennsylvania Department of Industrial Research; the Croxton studies of Buffalo unemployment and the experience of union, establishment and other private insurance funds; (2) they are broader in scope than local studies, but by their nature developed in an emergency and probably will not be collected after the emergency has passed: in this class fall the 1934 detailed statewide study of the Pennsylvania State Emergency Relief Board and the sporadic federal census series; or (3) they are again more than merely local studies but are discontinuous, incomplete or represent a special unemployment risk: for example the trade union unemployment rates for New York and Massachusetts, and (perhaps) the statistics of the American Federation of Labor. With the exception of federal census data, although they are generally adequate for their particular purposes, all are samples. There is practically no uniformity between the different series either in the definition of basic terms (*e.g.*, Who is unemployed?) or in the kind of data collected. In this field the Federal Government has barely reached the stage of encouraging standardization of statistics, not to say collecting them.

In order to calculate with reasonable accuracy unemployment benefit costs and reserves the following unemployment statistics are basic: (1) the number of persons employed, (2) the number of persons unemployed and the duration of their unemployment, and (3) payroll classified by wage group. Other rate-making data, such as the ratio of the number of claimants on a given day to the total number of unemployed for a year, and the average number of unemployed spells per insured, would be highly desirable but are not absolutely essential. Of the three essential data above, the second and third are relatively the most important. It is quite likely that we shall

have to begin our unemployment benefit plans without real data even for these.

Standardized statistics on the number of persons at work; on the number out of work part- and whole-time classified industrially, occupationally, geographically, and by sex; the number of claims for unemployment benefit; the duration of unemployment; the number of claims allowed and disallowed classified by cause of disallowance; average claim and administrative costs; the number of persons placed in jobs; the number of openings certified by employers: all these are elements in determining the quantity and quality of the unemployment risk. They must be a part of any administrative system which attempts to coordinate intelligently labor supply and demand and reduce unemployment through more efficient placement; to determine accurately contributions and reserves; and to develop checks on speed and equity in claim adjustment. They will not be possible on any local piecemeal plan.

Old Age Insurance Statistics—The statistical requirements for old age insurance or "pensions" are simpler than for either of the social insurances already discussed. Old age data are more reliable even than those for industrial accidents and have been in use by private insurers for many years. There is also no question of prevention and once allowed, an old age claim, unlike workmen's compensation, unemployment, and health insurance claims, is generally continuous, minimizing the need for refined administrative checks. As with the unemployment risk, we are still in the stage where statistics are necessary both to test the need for the insurance and to decide on the best kind of plan for providing it.

The fundamental data needed for calculating the proportion of old persons in the whole population are found in the federal census reports, in insurance company experience and in special studies made by old age pension commissions. No one has yet suggested the impracticality of true old age insurance on the ground of statistical defect. But the existing so-called old age "pensions" in this country are really not pensions at all. In the considerable variety of laws in the 30 states which provide old age payments to persons of 65 or 70, not one pays without strict residence or citizenship requirements, without moral qualifications or without proof of need. These pensions are, that is, improved more formally organized out-door poor relief and are even so designated in several states. The ultimate, and even the immediate cost of these poor relief systems is not easy to calculate in advance. The amount of state appropriation

available is the principal determinant of their cost. The Federal Government independently gathers no old age dependency data.

If we initiate in this country true old age insurance, that is a plan to which practically every citizen would belong, supported wholly or partly by the members, and (perhaps) with contributions graded according to wage group, the statistical problem will be considerable but not insuperable. The more important calculations would be based on federal population statistics modified principally for elimination of non-eligible persons. Comprehensive information on wage and salary classifications for eligibles is not available, as search for similar data by unemployment insurance statisticians has disclosed. Should we decide to extend and perpetuate the existing "pension" schemes the statistical difficulties (though not the financial cost) would be greater. There is now available no dependable basis for calculation and as long as payments are contingent on shifting tests of dependency or the fluctuations of state appropriation there can be none.

The statistics to be produced by an old age insurance plan would consist essentially of: the number of persons covered by the insurance scheme; the number of persons aged 65 or 70 (or the statutory age for retirement); the number of persons actually drawing benefit; average claim and administrative costs; classified wage and salary groups.

Health Insurance Statistics—Administration of a going public health insurance system needs statistics to secure efficient claim treatment, to assure speedy claim payment and the safety of the insurance fund, and perhaps to a degree even greater than for industrial accidents, to promote as intensively as possible prevention activities. When and if we have a health insurance fund, we shall have to decide between benefit payment in cash and in medical, hospital or other treatment or on the proportion between the two. Either method of benefit payment but particularly the second will result in new, extensive and pervasive relations of the public with the medical profession. By either method it will be our great temptation to pay, to indemnify rather than to prevent. Administration can be either a handicap or an impetus to sickness prevention. Preventive activities will depend at least partially on the use of statistics.

In this field we have statistically least of all to build on. On actual medical, hospital, dental and similar expenditures, classified by kind of service or by income group of the recipient; on the costs of complete medical care; on the number and income class of persons not receiving medical care, we have simply estimates.

The statistics a health insurance system would be expected to produce would include: the number of persons covered classified by age and sex; the number disabled and the number on benefit classified by age, sex, and cause; duration of disability; average claim and administrative costs; the number of claims disallowed and reasons for disallowance.

A 48-State Plan for Social Statistics—The most important single part of a comprehensive national plan of social insurance statistics must be the insistence, by one method or another, on uniformity between the states. Perhaps this can be achieved through the proposed procedure of the Wagner-Lewis unemployment insurance bill, which would remit a federal payroll tax to the individual states in proportion as their unemployment benefit schemes would approach a given standard of excellence. Unemployment insurance standards must and will include unemployment statistics. Perhaps state statistics could be coerced or coaxed into line by federal subsidy. Or perhaps uniformity may be secured by extension of the principle of interstate compacts, as with child labor, but this is least likely. At any level of intrinsic excellence, to put interstate statistics on a uniform basis will be to multiply by many times their usefulness. Once the all-important principle of uniformity is established it will be fairly easy to agree on the extent and nature of the plan.

The outlines at least of a coordinated social insurance statistical plan for the whole country have been suggested. Experience in workmen's compensation has demonstrated both the need for and the obstacles in the way of adequate and uniform statistics. Badly off as we are, it is true that in workmen's compensation we have a semblance of uniform statistics in spite of political boundaries, because large employers and large insurance companies can not and do not recognize these boundaries. It seems more likely than ever in our history before, that in the new social insurances, for one reason or another, the states will for once exchange a modicum of their political sovereignty for a tremendous social and economic advantage.

EUROPEAN EXPERIENCES AND NEW DEAL STATISTICS

By Karl Pribram

The typical development of central European administrative statistics can hardly be better illustrated than by the history of the *Austrian Statistical Yearbook*, the periodical preparation of which was included among my official duties during the last years before the beginning of the war.

The Austrian Statistical Yearbook originated in 1830 under a system of authoritative State policy. In the introduction to the first volume, statistics is characterized as a science which is called to investigate, in a systematic manner, the actual conditions of the States. It is understood to form the connecting link between history which is dealing with the past and the political sciences which are establishing ideal schemes of the social structure and of the administrative machinery. This social philosophy which assigned administrative statistics a rank at least equal to history and the political sciences was based on a concept of the State being an organic unit the functioning of which can best be grasped by combining the statistical material available into a coherent system of statistical tabulation. To what an extent this ambitious program was possible of practical realization at the time when it was devised is of secondary importance. What matters in the first instance is the outright synthetic concept underlying the objectives of administrative statistics. This concept found its adequate expression in the creation in 1840 of a Central Statistical Board charged with the task of providing for any figures which might be held necessary for the execution of the program.

However, in the course of the following decades this synthetic concept was superseded by a strictly analytical and atomistic one under the rule of the individualistic social philosophy, the growing influence of which was largely fostered by the development of the capitalist economy. This philosophy, as is well known, is based on the assumption that economic and social progress and well being are best to be served by the free working of individual forces. Statistical surveys, apart from those needed for the immediate requirements of important administrative departments, were now prepared with a view of illustrating developments occurring in specific fields of economic and social life. There existed synoptic tables relating to foreign trade, to saving banks, to bankruptcies, to criminal proceed-

ings, to educational establishments and so on, but the idea of arriving at a consistent comprehensive and continuous survey of the economic and social development of the empire had been completely discarded.

Under the rule of the individualistic philosophy, the very nature of administrative statistics was deeply altered. The middle classes which had come to determine the tasks of administrative departments and public authorities were utterly opposed to any far-reaching intervention or even insight, on the part of the Administration, into their private or business life. Moreover they deeply distrusted the Executive. Therefore statistical investigations requiring cooperation or at least assistance on the part of the public, were reduced to what was considered indispensable. On the other hand, lack of confidence in the Executive found its expression in the demand for wholesale and unrestricted publication of all details supplied by such inquiries. No doubt, this coercion imposed on administrative statistics was helpful in bringing about statistical conscientiousness. But the analytical spirit which dominated all methods used in these statistics is reflected in the vast profusion of figures presented in tabular form. Compilation and publication of tables were almost made objects in themselves. Creative synthesis was the less likely to be applied, the more the range of the statisticians' knowledge was limited to the methods used in compiling and tabulating. Such a synthesis is, of course, dependent upon the insight into the varying problems which stand in need of being examined and cannot be derived from the statistical material as such.

The development of the analytical type of statistics was paralleled, in Austria, as in many other countries, by a characteristic reform of the statistical services. Since there was no more need for arriving at a synthetic, systematic and continuous survey of all economic and social forces of the country the idea of centralizing statistical activity in a single board was dismissed and each administrative department was anxious to provide for its own statistics. Apparently strong arguments were advanced in favor of this decentralizing tendency. Each department pretended to know its own statistical requirements better than a central statistical office could. Hence the Central Board lost many of its former activities.

In order to avoid overlapping and duplication and to secure a certain degree of coordination of statistical work a Central Statistical Commission was created in 1863. In so doing Austria was the twelfth State which followed the example set by Belgium. Though this Commission played an important role in defining the objectives

and methods of administrative statistics, it favored rather than prevented the process of decentralization which was in close harmony with the ideas of economic and social philosophy ruling up to the beginning of the World War.

These ideas found expression also in the development of autonomous statistical offices attached to the administrative departments of the countries of which the Monarchy was composed; and many municipalities having grasped the value of statistical information extended their statistical services. But there was no control, on the part of the Central Board, over the activities of these independent statistical organs.

Perhaps the greatest service which the Central Board rendered consisted in the admirable training which it provided for its members. The Directors of the Board, chosen from the ranks of University teachers, were anxious to keep in close touch with Vienna University and to form seminars for their collaborators. Though the statistical services did not offer brilliant careers to ambitious candidates, many able young men preferred to start at the Central Statistical Board which, on account of its excellent reputation, was a recruiting place for important administrative posts and professorial chairs. Consequently there was rather a rapid change, especially of the younger members of the Board, but this fact, far from seriously impairing the efficiency of the statistical machinery prevented its work from petrifying into red tape and routine. There were few who were statisticians and nothing else among the gifted officers of the Board; each of these officers went on in pursuing his studies in various fields of economic and political science. The better he succeeded in broadening his knowledge, the more comprehensive were the aspects under which he considered his strictly statistical tasks. The general system adopted in perparing and carrying through statistical investigations was flexible enough to permit constant variations and improvements being attempted and performed. The dismemberment of the Austrian monarchy put an end to this organization of statistical services which to such a high degree had embodied the spirit of an individualistic period.

There exists, alongside of the synthetic and the analytical type of administrative statistics a third type which might be termed, for want of a more adequate expression, the combining one. It is the outcome of an economic and social philosophy which was basic to the German historical school of reasoning and is inclined to apply the concept of a living organism to the national economy, to the population of a given State, and to any social activities. As with synthetic

statistics, some concept of unity is brought into play here, conducive to attempts at combining the result of statistical investigation, but this concept is evolutionary in nature. On the other hand analysis is given an important role and the development of each section of economic or social life may be conceived as a separate and independent evolutionary process. The promoters of this type of statistics, lacking a clear-cut and consistent insight into the problematic nature of their fundamental concepts never succeeded in clearly defining their ultimate objectives. But in practice this anti-individualistic movement tended strongly toward centralizing administrative statistics.

The organization set up in the German Reich is a very characteristic instance. With few exceptions all important branches of statistics of the Reich are included in the activity of its Central Statistical Board. Moreover the independent statistical offices existing in the various German States, though not subordinated to the Central Board, nevertheless operate in so close a connection with it that uniformity of methods can be secured for any investigation carried on with the assistance of the territorial services. Finally, municipal statistics developed so successfully that no less than about 70 cities with more than 50,000 inhabitants each are equipped with special statistical services.

Since this far-reaching development of statistical services in Germany resulted in the appointment of a considerable number of well qualified statistical officers, the prospects of a purely statistical career were relatively promising. Hence careful preparation for this career was made the objective of a number of students during their college years. Teaching of statistics at the universities was closely adapted to their needs; the old tradition of cameralistics which considered statistics as an important branch of administrative science was never completely broken. Thus, up to the present, textbooks are practically filled with instructions how to prepare, carry through and utilize statistical investigations devised for administrative purposes. Abstract statistical theory—not to speak of business statistics—is comparatively neglected. On the other hand, training in economics and in political science which forms an integral part of his curriculum will provide the professional statistician with a good knowledge of the more general problems involved in his work and enable him to ponder the various aspects of the inquiries in which he is engaged.

The tendency to combine the results of various independent investigations is conducive to the discovery of fields of activity or social

conditions hitherto unexplored by statistical methods. Similarly new methods are tried out when inquiries made in the past are to be continued or repeated.

There can hardly be found a more characteristic practical embodiment of the philosophy of the combining type than the statistical machinery set up by the German Institute of Business Cycle Research which until recently was closely connected with the Statistical Office of the Reich and was semi-official in character. The efforts made by this Institute to fit together into a unified moving picture all available series of statistical data relevant to the economic conditions of the country are the more remarkable as they are not directed by a consistent business cycle theory. The influence exerted by the comprehensive studies of this Institute on the development of Germany's administrative statistics can hardly be overestimated.

It must be left to the judgment of those better conversant than myself with the structure of American administrative statistics to draw inferences as to the merits and drawbacks of what I have said about European experiences. In order to suggest some reflections I venture to add some observations.

Until recently, the organization of American administrative statistics was of the atomistic type; to a much higher degree than any corresponding European organization. There never existed in this country anything even resembling synthetic administrative statistics.

However, the philosophy of the New Deal, if I am correct in appreciating it, is characterized by a tendency which is obviously akin to the ideas fundamental to the combining type. The influence exerted by this philosophy is, I submit, mainly due to the fact that the economic history of this country has reached a point where rapid and unlimited economic expansion cannot any longer be reckoned upon with a fair degree of probability. Heavy and prolonged restrictions of markets for important commodities are likely to suggest the urgent demand for some sort of regulation extended over entire trades or even, as is the case with agriculture, over large spheres of productive activity. The development of New Deal statistics is essentially motivated by the need to get reliable statistical information on which to build up regulatory measures.

But as far as I can see each section of the economic life of the country is considered as resulting from separate evolutionary processes and the valuable efforts made by the statistical services of the various departments of the New Deal are pursued separately. No attempt has yet been made to arrive, by combined action, at a comprehensive insight into American economic and social conditions. Also

the newly created Central Statistical Board is rather of the type represented by the European statistical commissions. Its functions are coordinating but not combining in nature and there seems to be no disposition to provide for some sort of centralized administrative statistics.

In striking contrast with the efforts made to develop new lines of statistics and to work out new methods adapted to their requirements, there are two debatable residues of the primitive atomistic organization. The teaching of statistics is ill adapted to the needs of the professional administrative statistician in spite of the great pains bestowed on training students in the application of statistical methods and of the outstanding level reached in this country by scientific statistical researches. Furthermore the development of federal statistics is not paralleled by a correspondent development in the states and municipal statistical services are almost entirely lacking. Is it possible or at least probable that the needs for statistical information can be met exclusively on national lines in a country of the size and the diversity of the United States? A causal relation is likely to exist between the lack of regional and local statistics and the lack of interest on the part of Universities in administrative statistics.

It may seem strange, but it is confirmed by experience, that the development of administrative statistics was, under the rule of individualistic tendencies, far more promoted by adverse than by prosperous business conditions. New lines of statistics were started when a need was felt for legislative or administrative action dependent upon statistical information. This general tendency is still characteristic of American administrative statistics. Delays in action are likely to result.

But the evolution of the American social philosophy was at a crossroad when the country embarked on the policies of the New Deal. It is not within my province to answer the crucial question whether the trend manifested in these policies will be so strong and lasting as to force upon administrative statistics the problems familiar to the combining type. The future of American statistics is dependent upon the answer which history will give to this question.

PROGRESS IN COORDINATION OF STATE AND FEDERAL COLLECTION OF LABOR STATISTICS

By Sidney W. Wilcox

No doubt the real duty of the speaker is to divest himself of presuppositions, but, falling short of that, he should state those that color his vision. I accept the fact that we have a State-Federal Government and that this political fact will have to be reckoned with in any proposed statistical set-up. I think it is well that the President, the Secretary of Labor, and many others in the Federal Government have had State training. It is well that those who now find themselves on the sending end, are able to carry over the results of their experiences on the receiving end. It is rather amusing to discover how utterly different is the point of view of some members of the Federal staff whose work has been confined to the Federal Government. Without pausing for illustrations of this, I can indicate the Washington point of view by the fact that though our theory of government makes the Governor of a State analogous to a king and the Senator analogous to his ambassador, nevertheless according to Washington etiquette, the Senator as part of the Federal Government enters the dining room before the Governor.

Not merely in recognition of the States, but because of the value of regional statistical offices there is need for solving the State-Federal problem. In a number of the highly centralized governments of Europe, with much smaller areas, there are branch statistical offices recognized as an indispensable part of the statistical set-up. Perhaps our state lines are awkward and we should prefer industrial prefectures, but we are on fairly sure ground in saying that a Federal-State pattern has both political and statistical significance.

Having said this we might as well admit that during the past year or two the tide has been running the other way. Drastic retrenchments within the States plus national approaches to industrial problems through National Recovery Administration code activities have made the livest question seem to be, "How can we integrate the work of NRA, the Bureau of the Census, the Bureau of Labor Statistics, etc.?" Successive forms of this difficult problem have been placed on the doorstep of the Central Statistical Board.

In September 1933, NRA Office Order 1-A directed that reports on employment, pay rolls, man-hours, etc., should be submitted both to Code Authorities and to the Bureau of the Census, with avail-

ability of the material to the Bureau of the Census, the Bureau of Labor Statistics, and the NRA. In October 1933, discussions revolved around a plan whereby the reports would go to a new agency, merging the current report-gathering services of NRA, the Bureau of the Census, and the Bureau of Labor Statistics. The Central Statistical Board's reply distinguished between four uses of the data and made recommendations to the following effect: For code enforcement and business management the proposed new agency would be satisfactory, but for determining business and labor conditions and appraising the working of the codes or the effectiveness of new deal policies it would seem necessary that the established reporting agencies be maintained.

In March 1934, NRA Office Order 34 stated that the firms were to submit reports both to Code Authorities and to the Bureau of Labor Statistics.

Of late there has been a resurrection of the idea of thorough integration through a central committee or other authority that would be half holding company and half *amicus curiae,* going so far on the one hand as to influence, shall I say direct, the activities of the various governmental agencies, but on the other hand operating through them and/or over them, rather than displacing these agencies.

I think that it may clarify our thinking if at this point we distinguish between "line control" and "functional control," after which we can study a formula that would call for decentralization of line control, but centralization of functional control. Suppose that the manager of a branch office of a manufacturing company should ask the bookkeeper to do some pinch hitting by waiting on a customer. The bookkeeper would say, "You bet." Suppose by way of contrast that the manager should say, "In England, where I got my business training we draw up our financial statements with the liabilities on the left hand side and the assets on the right. Will you please draw up the balance sheet that way?" The bookkeeper would say, "I think, sir, that this is a matter that we should clear through the chief accountant in the home office." Why "yes" in one case and "no" in the other? Because the first was a line control question and the line control had been decentralized. The line was from the home office through the local manager to the bookkeeper. But the second was a functional control question and the functional control is centralized in the person of the chief accountant in the home office. The local manager cannot interfere with the technique.

Let us examine this principle of decentralized line control but centralized functional control, to see what it is worth in setting up a

working program first between the various Federal agencies and secondly between the Federal and State Governments.

It looks in the direction of maintaining the present channels of industrial statistics, some types of monthly reports, for example, flowing through the Department of Commerce, more particularly the Bureau of the Census, and some through the Department of Labor, more particularly the Bureau of Labor Statistics. But it requires centralization of standards, techniques, classifications, policies concerning mailing lists, and control of the time, place and form of the resulting tabulations to facilitate adequate interpretation.

It is worth noting that it would not be inconvenient to the reporting establishments to send various kinds of reports to different government addresses assuming that self addressed franked envelopes accompany the questionnaires. Even with those statistics known as labor statistics the employment and pay-roll data are supplied by the pay-roll department but the labor turnover figures are supplied by the personnel department so that separate questionnaires are a convenience to the firm and they certainly facilitate more prompt gathering of the statistics. The questionnaires may, therefore, be in separate parts, provided only that there is no duplication. Subject to this limitation the problem is at the receiving or government end.

I can visualize corridors of the Commerce Building marked at different intervals with the names of various industries or industry groups and with the rooms on one side of the corridor devoted to the analysis of the "labor statistics" for each successive industry and on the other to the study of the corresponding production and other commerce statistics. The location of the tabulating machines is not so important, but close proximity, personal friendship and free interchange of information and tabulations should characterize the specialists of Commerce and of Labor as they study the movement of American industrial life. The difference in departmental names registers the separateness of the line control; the proposed layout for analysis symbolizes unified functional control, presumably under a central coordinating board. The proposed layout is in accord with the insistence of organized labor that access to primary sources of information must be maintained by the Department of Labor, while at the same time provision is made for the scientific requirements of comparability and of the accessibility of the various kinds of data for simultaneous consideration.

With the states the same principle could be worked out. Our type of government implies considerable decentralization of line controls. But if, for example, the U. S. Bureau of Labor Statistics paid half of

the salary of the various State Directors of Labor Statistics, if these State Statisticians were brought to Washington once a year for a period of training and of work on certain kinds of Federal statistics and if the Federal Bureau had traveling experts or auditors to advise and check on the work of the states in employment statistics, accident statistics, etc., there could be all the advantage of local contact with the firms as implied by state offices without sacrificing comparability or scientific standards.

The inconvenience to the firms and to the Code Authorities of making state breakdowns of their statistics must be admitted, but such classification must be made in connection with accident statistics since the Workmen's Compensation laws are state laws, and they will have to be made for employment statistics if, or rather when, we have unemployment insurance laws.

My counsel, therefore, as far as I am privileged to give any, would be to work within the framework of our State-Federal form of government and within the framework of our departmental set-up in Washington and in the States, but to overcome the dangers of decentralized line control by centralized functional control in the form of a board or committee in Washington which will be the flowering of the Advisory Committee appointed by the American Statistical Association and which would promote a system of personalized grants in aid to the States,—that is, grants consisting of, or directed toward, the goal of the right kind of personnel.

We have witnessed in the last few years a remarkable transfer of governmental responsibilities from the States to Washington. My surmise is that the State statistical offices will receive Federal support and will add branch office activities. Perhaps we shall become accustomed to some such name as, "Federal-State Statistical Office."

A PLAN FOR THE COORDINATION OF STATE AND FEDERAL ACTIVITIES IN THE COLLECTION OF AGRICULTURAL STATISTICS

By H. R. Tolley and O. V. Wells

Although an increased volume of statistics is needed, expansion as such is not a guarantee of either an adequate statistical background or an efficient statistical organization. Our statistical services should be so organized and coordinated, and any expansion so directed, as to assure an adequate volume of agricultural statistics at a reasonable cost. This discussion will be centered upon (1) the several agencies interested in the collection of agricultural statistics, (2) some of the statistical series or services which should be expanded and coordinated, and (3) the suggestion that a Coordinator of Agricultural Statistics for the Federal Government be appointed to work with the several committees which are already concerned with the coordination of statistical work.

A catalog or list of the several agencies which are interested in the collection of agricultural statistics is enough to indicate the need for coordination. Within the Federal Government itself are the Bureau of the Census and the Bureau of Foreign and Domestic Commerce in the Department of Commerce; the Bureau of Agricultural Economics, the Agricultural Adjustment Administration, the Bureau of Animal Industry, the Grain Futures Administration, the Forest Service, the Bureau of Home Economics, and the Weather Bureau in the Department of Agriculture; the Bureau of Labor Statistics in the Department of Labor; and the Farm Credit Administration. Certain statistics of considerable interest are also collected by the Bureau of Internal Revenue and the Interstate Commerce Commission.

Separate divisions within the Bureau of the Census are concerned with the Census of Agriculture and with the Census of Manufacturers. Within the Bureau of Agricultural Economics, statistics are collected by the Division of Crop and Livestock Estimates, the Division of Statistical and Historical Research, the Division of Land Economics, the Division of Farm Management, the Division of Cotton Marketing, the Foreign Service, the Market News Service, and the Division of Rural Population and Farm Life.

State agencies are State Departments or Commissioners or Boards of Agriculture and/or Marketing which gather statistics through

state censuses and as a by-product of a wide range of regulatory work, State Experiment Stations, State Sanitary Boards and State Veterinarians, and State Control Boards and Commissions. Agricultural statistics are also gathered and released by commercial handlers of agricultural products such as cooperative associations, railroads, millers, peanut shellers, packers, and grain exchanges; by trade associations such as the Canners League of California; and by trade papers such as the *Chicago Daily Drovers Journal.*

Another approach to the problem can be obtained by the consideration of some of the more important types of data which are collected or should be collected and of the agencies and methods involved. The work of the Agricultural Adjustment Administration has indicated the need for a more accurate determination of the acreages and production of the chief crops and for more detailed data with respect to county acreages and production. The sources of almost all the acreage and production data are the Censuses of Agriculture and the annual estimates of the Division of Crop and Livestock Estimates. For the most part the census data are tabulated and published by counties but the crop estimates data are almost altogether for states. Assessors' censuses are available in some states.

What is needed is some expansion in the collection of acreage statistics and a closer cooperation between the Census, Crop Estimates, and the agencies responsible for the assessors' censuses in the several states. Since the general Agricultural Census is all-important, the census schedules should be so arranged and the census enumerators should be so trained as to obtain a uniform and complete census in every county in the United States.[1]

The next step should be to improve the annual estimates of the Division of Crop and Livestock Estimates and to arrange for the compilation of county as well as state estimates where desirable. If assessors' censuses could be improved or if a sample census could be worked out to supplement the present voluntary questionnaire method, considerable improvement should be possible in the annual estimates of both acreages and production.

Additional sources can be drawn upon in estimating the production of crops and livestock. In addition to the Census, a large volume of processing and marketing data is being used which should be even more valuable if it could be expanded somewhat and correctly organized. Slaughter under Federal Inspection, for example, could

[1] For an extended discussion of the agricultural censuses with some suggestions for improvement see: Tolley, H. R., and Black, J. D., "The Administrative Use of Agricultural Census and Intercensal Data," and Black, J. D., "The Coming Agricultural Census Enumerations," *Journal of Farm Economics*, Vol. XVI, No. 3, July 1934.

be supplemented by data on the slaughter of livestock under State or Municipal Inspection, together with accurate censuses of farm slaughter.

Analysis of several of the marketing problems in which we are currently interested is made almost impossible by the lack of adequate data. To improve the situation, it would be desirable to obtain the revision and coordination of many of the shipment and market receipts data which are now reported, the development of an adequate method of covering and accounting for the movement of all classes of agricultural commodities by motor truck, and the improvement and coordination of the several series of prices at the farm, at wholesale, and at retail which are already collected. Additional data with respect to the stocks and consumption of certain processed products would also be helpful. Such a program would not only require coordination but would also require the establishment of some new agencies or a considerable expansion in the work of some of the already established agencies to cover the motor truck movement.

Any number of other examples can be given. Another, and an especially important field in which extension and coordination is needed is concerned with the estimates of gross and of net agricultural income by commodities and by counties and states as well as for the United States. Other fields have to do with the whole problem of land utilization, the number, composition, and movement of the farm population, and the utilization and consumption of the several agricultural commodities including such derived products as foods and cloth.

So far, we have been chiefly concerned with the scope or coverage of the statistics in question. It is also desirable that almost all of the statistics discussed should be collected and reported in greater detail than at the present.

The goal of the coordination of state and federal activities in the collection of agricultural statistics should be a general acceptance and observation by all of the agencies concerned of a general plan specifying the classes of statistics which are wanted, the time intervals and geographic areas to be covered, the methods of collection and compilation to be used, and the general division of the work among the several agencies concerned. This can best be achieved by the coordination of the statistical work which is centered in the federal agencies in Washington, the integration of the work of the state and federal agencies in each state under the direction of a single State Statistician, and the enactment and enforcement of uniform laws to provide for an adequate annual assessors' census and for the

reporting of the receipts or shipments of agricultural commodities in each state.

A closer coordination of the work of the several interested agencies of the Federal Government should be obtained. Some changes in the Census of Manufacturers, for example, might well make it much more useful from the standpoint of the Department of Agriculture. Since the Census is not usually interested in analytical work as such, it would seem that some arrangement should be worked out which would allow the Census to utilize the services of the specialists in the Department in analyzing the returns secured and suggesting methods by which improvements might be obtained. Also, despite a cooperative committee, it is evident that the work of the Census of Agriculture and the Division of Crop Estimates in the Department should be more closely coordinated. Again, it would seem that both the Bureau of Labor Statistics and the Bureau of Agricultural Economics would stand to gain if they could work together in revising and coordinating the several price series which are collected through the Divisions of Wholesale and Retail Price Statistics and the Market News Service.

All state work, as suggested by Dr. Black, should be combined under a single State Statistician who would represent the State Department of Agriculture, the State College, and Crop Estimates, and who would also be the State Director of the Census.[2] Such an integration is highly desirable. It would guarantee effective cooperation within each state. At the same time, the relation of the State Statistician to the Bureau of the Census and the Division of Crop and Livestock Estimates should result in the coordination of the statistical work as between states. The establishment of such a system, under a cooperative financial arrangement, should tend to insure that the various state interests represented would obtain the special statistics which they might need, should allow the appointment of an able State Statistician in each state, and should tend to encourage a general movement toward the decentralization of the statistical work of the Federal Government which is apparently needed.

State offices of the Market News Service should be brought under the State Statistician as should also the statistical work of the several regulatory divisions of the State Department of Agriculture and/or Markets. Almost every state has a Dairy Control Board or Commission. Data collected through such agencies could usually be made quite useful by some changes in the questions asked, by some attention to the coverage obtained, and the proper editing and tabulating

[2] *Ibid.*

of the material collected. The work of the State Sanitary Boards in the West could be so arranged as to provide some very useful information. And the information obtained from the required reports of tobacco sales in the South could be much improved. All regulatory work should be administered by the State Department or Board rather than the Statistician.

The introduction of a uniform law or the revision of the several laws already in effect with regard to state censuses of agriculture is also needed. As a general rule, assessors' censuses as taken under the present laws are incomplete and can rarely be used for anything beyond the rough determination of the relative year to year changes in the acreages of crops and the numbers of livestock.

Some of the comments which have recently been received by Mr. Callander with reference to assessors' censuses are enlightening.[3] An analysis of these comments reveals that the censuses are usually incomplete, enforcement is not strict, and the livestock data are often worthless because livestock exempted from taxation are not recorded. Where the assessors' reports are not edited and tabulated by the State Statistician, the funds available through the regular state sources are usually not sufficient to provide the proper personnel. In addition, such data as are now collected are generally for some specific date in the spring and are not comparable with other available data.

A model assessors' law should be drawn providing for an historical census and for enforcement and every effort should be made to secure its adoption in each state. The several state censuses should be taken at approximately the same time of the year and the data should apply to the same specific past period. According to Mr. Callander, it is estimated that an excellent assessors' census could be taken, in states where an assessor's report is made out for each farm, for an additional cost of about ten cents per farm visited. After the schedules are filled out, they should be turned over to the centralized state office to be properly edited and summarized. If such an approach cannot be worked out, or in states where assessors' reports are not made out, the next best approach would seem to be the use of the annual sample census by townships which was proposed in the Buchanan Bill. Such a sample census should cost no more than the additional cost of an assessors' census and might well be more reliable.

Actual experience has demonstrated that the combined centralized

[3] The authors wish to acknowledge the assistance of Mr. W. F. Callander, Chief of the Division of Crop and Livestock Estimates, who allowed them to read a series of letters from the several State Statisticians of the Division with reference to the various laws relating to the collection of agricultural statistics in each state.

state office-assessors' census can be used to obtain an efficient state organization. In Wisconsin, which is perhaps the best example, the collection of agricultural statistics is carried on through an Agricultural Statistician who is jointly employed by the State Department of Agriculture and Markets and the Division of Crop and Livestock Estimates. State laws with regard to the collection of agricultural statistics provide for an annual assessors' census and for the collection of dairy statistics at least once every two years. Although all of the statistical work is done by the Statistician, the regulatory or police functions arising from or connected with the collection of the statistics are administered by the State Department rather than by the Statistician.

The improvement of the data with regard to shipments and market receipts of agricultural commodities is especially needed. Statistics with regard to the motor truck movement will not become available until the reporting of truck receipts on the part of receivers is required or until motor trucks are regulated in much the same manner as are railroads. Since the second alternative is certain to be slow in developing and exceedingly complicated, it would seem best to support a general movement for the enactment of a series of uniform laws requiring the reporting of receipts of all agricultural commodities by certain classes of receivers. As in the case of the assessors' census, a model law providing for the reporting of receipts and for reasonable penalties should be drawn and offered for adoption in each state.

The desired coordination of the statistical work relating to agriculture in the states and in Washington cannot be brought about by an expression of opinion by any single individual or group. Action is required.

We should recognize that the work of collecting agricultural statistics has increased to the point where continued attention should be given the problem of organization and coordination. A beginning has been made in the work of the Committee on Governmental Statistics, and such committees as the Joint Committee on the Census of the American Farm Economics Association and the Social Science Research Council and the Census Committee of the Department of Agriculture.

Although the work of such committees should be continued, it would also seem advisable, first, to create a small Advisory Committee on Coordination and, second, to obtain a modest annual appropriation for research work on the collection and compilation of agricultural statistics and place it at the disposal of a Federal Coordinator of

Agricultural Statistics. The Advisory Committee should direct the work of the Coordinator and maintain contact with the several other committees and agencies that are interested in the coordination of statistical work.

The Coordinator, who should be jointly appointed by the Bureau of the Census and the Bureau of Agricultural Economics and who might also be a member of the Central Statistical Board, would be charged with the active promotion of such coordination as the Advisory Committee might recommend and with the direction of a small volume of research work on the collection and compilation of agricultural statistics in cooperation with the several agencies concerned. The Coordinator, provided an annual appropriation of $50,000 to $75,000 could be obtained, should act as an exchange for such ideas as the analysts in the states and the Federal Government may offer; and work with the several interested committees in coordinating the work of the agencies within the Federal Government itself, in encouraging the integration of state and federal activities in the several states, in supporting the model or uniform laws for assessors' censuses and the reporting of receipts by receivers wherever the advantage should offer, and in making recommendations for the expansion or reorganization of certain classes of statistical work.

APPLICATION OF PUNCHED CARD METHODS TO HOSPITAL STATISTICS

By Halbert L. Dunn and Leonard Townsend

Generalized system of punched card methods for individual patient statistics: The following plan for obtaining statistical information concerning both clinical and surgical patient records and financial data is used at the University of Minnesota Hospitals. The plan consists of three major divisions: Admissions, Discharges, and Rejected Admissions, each of which is divided into In-patient and Out-patient groups. These groups are further divided according to desired studies. A particular study may be expanded to a maximum of ten cards.

The following information which is necessary to identify a particular card and to match corresponding cards in various parts of the system is included in all studies: case number, admission number, admission or discharge type, institution number, state and county within which the institution is located, admission year, card class, and sub-class (card class and sub-class are for the purpose of identifying each study and card within the study).

1. The admission division includes three studies: basic patient data, diagnostic, and financial. Space is allowed in each study for further expansion on nine additional cards.

   1.1 The basic patient data study consists of the name, address, and county of the admitted patient in the alphabetical portion of the card, together with the following information punched numerically; case number, admission number, admission or discharge type, state and county of institution, institution number, month and year of admission, age, sex, civil state, occupation, eligibility and county of patient's residence.

   1.2 The diagnostic study in this instance has reference to the provisional or admittance diagnosis and consists of the diagnosis shown alphabetically in the first part of the card; the code number of the diagnosis, and the diagnostic qualification which is punched numerically.

   1.3 The financial study includes all data relevant to the financial status by means of which the eligibility of the patient for admission is determined.

2. The discharge division includes five studies each for both In-

patient and Out-patient group: the diagnostic, surgical, financial, laboratory and x-ray, and general. Expansion is allowed in each for nine additional cards.

2.1 The diagnostic cards punched on discharge deal with all diagnoses made in each case for a particular admission. One card is punched for each diagnosis and, in addition to the information common to all study cards, includes the following: the alphabetical diagnostic description in the words of the doctor, the year of discharge, the diagnostic code number, the number of diagnoses and surgical procedures for the case, qualifications of the diagnosis such as repetition within the year or for the case over a period of years, degree of sureness of the diagnosis, specification of medical, post-operative, pathological type of diagnosis, complication, duration of illness, etc.

2.2 The surgical study includes the alphabetical description of the surgical procedure in the words of the surgeon, the surgical code and qualifications of the surgical procedure.

2.3 The financial study appertains to the patient's account for hospital service, both charges and collections.

2.4 The laboratory and x-ray study deals with qualitative and quantitative findings and x-ray examinations.

2.5 The general study includes all the information not otherwise classified in the above studies. Hospital daily census data comes under this classification and deals with an analysis of patient days in relation to hospital stations and services.

3. The rejected admission division includes three studies, as follows: the basic patient data, which is identical with the study described in paragraph 1.1, the diagnostic study which deals with the diagnosis for which the patient is referred and which is frequently a contributing factor toward the rejection or admission of the patient, and the financial study, which is identical with the study described in paragraph 1.3.

The divisions are kept in separate files with the In-patient and Out-patient cards together and are ordered by case number and year with the exception of the diagnostic and surgical cards, which are filed according to code number. The basic patient data cards are filed separately from the division study cards and may be correlated with any of the other studies for special reports.

A great advantage of the above system is its flexibility and capacity for extension by the addition of other studies, its suitability for all hospitals, and its complete adaptation to the printing tabulator.

This last feature permits all data contained on the various punched cards to be transferred into printed records thus placing the entire plan at the disposal of small hospitals if a central tabulating service is available.

Material distribution of goods within the hospital: Material distribution of goods within a hospital is a problem ideally adapted to punched card methods. A knowledge of departmental budgets does not give the hospital administrator a strict control of *how goods are consumed.* If he is faced with the necessity of economizing and conserving the use of these goods within his institution, it is not sufficient that he know how much goods he has purchased. At all times he should know the actual expenditures of the departments in both quantities and values of goods which they use. With such knowledge he is able to control expenditures of goods where they are excessive without irritating the hospital staff by attempting control over negligible wastes.

The following method of material distribution is in use at the University Hospitals.

The purchase of supplies is accompanied by an invoice. The invoice carries the name of the article, the amount purchased, the unit price and the total price of the article together with the number of the hospital budget upon which the supplies were charged. In order to arrive at a correct unit price, the discount for a particular invoice is figured for each item on the invoice.

The stockroom is provided with a post binder containing sheets for each item carried in stock. Each sheet not only serves as a punching source for material distribution cards but also as a perpetual stock inventory.

When a station desires to order an item from the hospital stockroom, an authorized person on such station makes out a requisition slip in duplicate. The stockroom clerk fills the requisition slip as soon as he receives it, indicating those items supplied with a check mark. If the requisition calls for items which are out of stock, he copies the out-of-stock items to a Rejection-Supply requisition slip. This slip on which is indicated the probable date at which the items can be filled, is sent to the station as a notice to reorder. As he fills the requisition from his supplies, the stockroom clerk notes the amount, balance, station, price, and date of the item upon the material distribution sheet.

Once a week a statistical clerk goes through the material distribution book in the stockroom and punches a material distribution card for each item, either TO or FROM, on the sheet. If the invoice has

been delayed and the unit price is not available, the clerk does not punch the material distribution cards for these items until the following week. Each entry on the material distribution sheet is checked as the material distribution card is punched for that item. The information punched in the material distribution card from the material distribution sheet is as follows: the stockroom number (Col. 1), the alphabetical name of the item (Cols. 2–41), the institution (Col. 42), the quantity to or from stockroom (Cols. 43–46), the station requisitioning the article or the station from which the article is received (Cols. 52–54), the price (Cols. 55–62), month (Col. 63), item number (Cols. 64–71), budget number (Cols. 72–79), and a card identity number (Col. 80). The quantity field of the card (Cols. 43–46) represents either the quantity of goods going TO or FROM the hospital stockroom. If the goods are going TO the stockroom, "x" (the position just above the 0 on the card) is punched in Col. 43, and if the goods are going FROM the stockroom, "y" (the next highest position) is punched.

The card identification number represents that particular application for which the card was designed and punched. Thus a station charge card for any TO or FROM stockroom transaction is punched "0" in this column. A *summary station charge* card is punched "2"; a *storage* card, "5"; an *additional billing* or *change in billing* card is punched "6"; a *rental* card, "7"; a *freight* card, "8"; and a *repair* card, "9".

Tabulations are made monthly from the material distribution cards. The material distribution cards for each item are sorted by means of the "x" punch mentioned above as to whether they are items going TO or FROM the stockroom. Items TO the stockroom come either from some station outside of the hospital by purchase or from some station within the hospital by the return of goods. Items FROM the stockroom go either to the stations in the hospital to be used or to stations outside of the hospital as goods refused and returned by the hospital to the vendor.

Tabulations of the station charge reports are of four principal types: an itemized report of all quantities going TO the stockroom and FROM the stockroom and a summary report of all quantities going TO and FROM the stockroom.

Tabulations of these same reports sub-headed according to the budget number under which purchases are made are kept only of the summary type and involve two tabulations, one of goods going TO the stockroom and the other of goods coming FROM the stockroom.

Space does not permit of examples of these tabulations to be shown here.

The ten major groups of the item code are as follows:

000–099	Housekeeping Equipment
100–199	Hardware
200–299	Office Supplies and Stationery
300–399	Table and Cooking Utensils
400–499	Food
500–599	Laboratory and X-ray Supplies
600–699	Apparel and Linens
700–799	Drugs
800–899	Surgical Supplies
900–999	Unclassified

A complete purchase analysis is obtained from the stockroom sheets which carry the vendor's name, the purchase order number, the maximum and minimum quantity to be kept in the stockroom for any particular item, and the balance on hand for such item at the date of receiving or disbursing. The item sheet may be flagged by tabs when the balance approaches the set minimum figures, as a notification to reorder.

The stockroom sheet also gives an item inventory at any time or furnishes the data for inventory cards to be punched for a complete stockroom inventory at the end of the fiscal year.

A METHOD OF ANALYSIS OF FIELD MALARIA DATA

By H. H. Howard, W. C. Earle and H. Muench

The data collected in connection with malaria control activities in Puerto Rico provided an unusual opportunity for the application of statistical methods. Figures had been carefully collected for periods of years ranging in some cases to seven and more. Controls have been provided for all stages of the work.

Malaria studies were carried on in seven main areas of the island, in one of which no control activities were attempted. The other six areas were divided into "inside" and "outside" zones. In the "inside" zones experimental measures were employed. "Outside" zones, as near as possible to the "inside" zones but beyond the limits of the work, served as controls. Activities in "inside" zones probably had some effect on the "outside," due to overlapping of mosquito flight ranges. Such effect would be inconsiderable in comparison with differences between the two zones which might be expected to follow mosquito control work, while the blurring of differences would tend to obscure, not exaggerate, any beneficial effects of the work. Ideally, the "outside" zone should show what would have happened in the "inside" zone had no control measures been carried out.

The practically important question to be answered is whether control activities had any measurable result. This resolves itself into detecting differences between an "inside" zone and its respective "outside" and estimating the significance of such differences.

The data bearing on these points fell into three classes: A. The incidence of malaria, in numbers of cases per month. B. Intensity of mosquito breeding, in monthly average numbers of larvae and pupae per dipping period. C. Density of adult mosquito prevalence, in monthly average catches per animal-baited trap per night.

There are weaknesses inherent in each type of data. A weakness of the trap-catch results lies in the difference in attractiveness of bait animals. A series of catches on one trap showed that a horse attracted, on an average, more than twice as many mosquitoes as a calf, the two being used in rotation. This rotation, however, should tend in the course of a month to equalize such differences. Aside from this feature trap catches appear to offer the most nearly objective measure of mosquito prevalence. In this study, therefore, the main emphasis will be placed on trap-catch data. These consist of monthly average catches, per trap per night, and are further restricted to captures of

A. albimanus since this is the species principally involved in malaria transmission in the island. With a minimum of experience this species is readily distinguishable from other Puerto Rican anophelines. Several permanently located traps were used in each zone. Few mosquitoes probably escaped after entering; in any case, the ratio of those remaining should be constant.

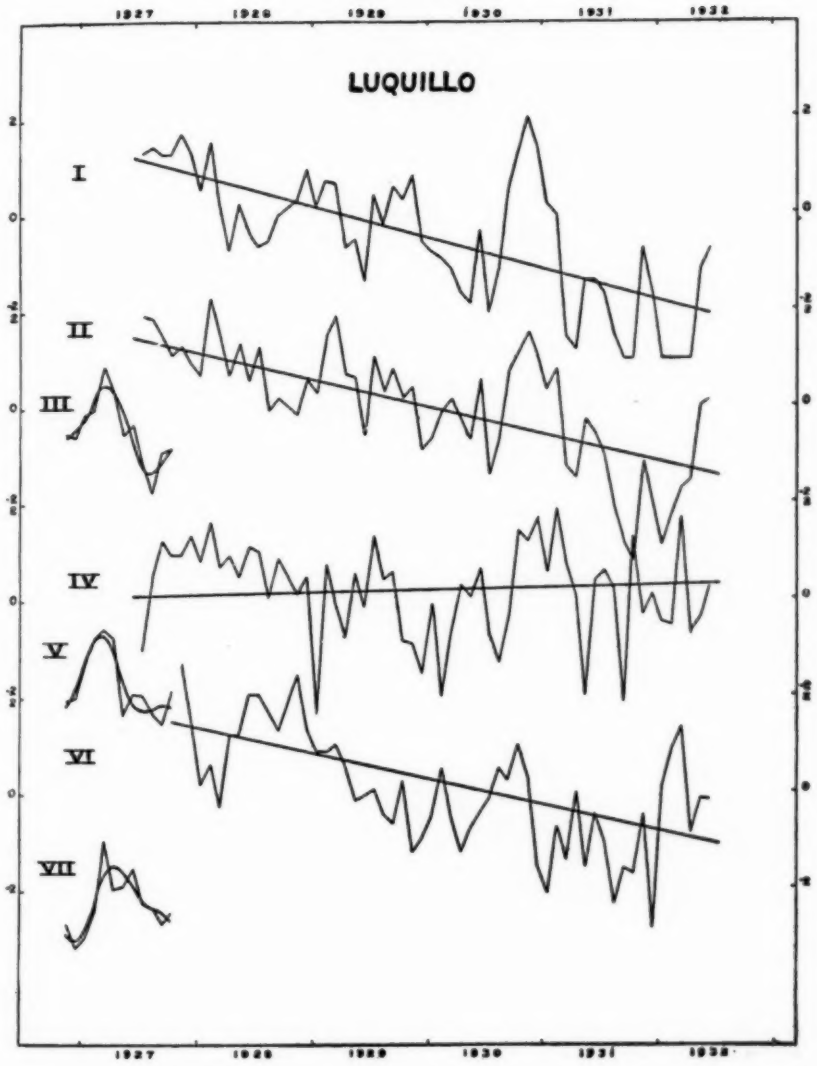
It is obvious that there must be differences in the gross levels of catches in various traps. In the same zone, a trap near breeding places might yield several times the number of mosquitoes found in a trap less favorably placed. It would be difficult to estimate the relative effectiveness of traps in different zones.

By using the logarithms of the mean monthly mosquito catches, this difficulty is avoided. Instead of dealing with actual frequencies, we measure relative changes. A constant difference in logarithms with time means a steady proportionate change entirely independent of the magnitude of the quantities measured. In other words, if the logarithms of monthly average trap catches in two zones plot as parallel lines, exactly the same relative change has taken place in both zones and the question of efficiency of traps does not enter.

The particulars of the method employed may best be illustrated by an example: monthly trap catches in Luquillo from July, 1927, through June, 1932. The years were so divided in order to bring near the middle the annual peak of mosquito production and of malaria in Puerto Rico. Graph I on the chart represents the logarithms of the mean trap captures for each month of a five-year span. (Natural logarithms have been used throughout). The straight trend line through the irregular monthly points has a "*b*" value of -0.05436 ± 0.00537, representing an average rate of decrease of 48 per cent annually. The trend line quite accurately describes the general slope of the points but there are considerable fluctuations around it. A large part of such fluctuation is regularly annual, a peak occurring towards the end of the calendar year. Seasonal variations in mosquito breeding are large even in a tropical country such as Puerto Rico.

The effects of these regular cycles would be: (1) To increase the scatter of the points around the trend and so the probable error of "*b*," the slope constant. (2) Possibly to affect the value of "*b*," depending on the position of the cycle and the number of years under consideration. For instance, if the span of years is short and begins with a maximum and ends with a minimum, there will be an apparent slope of the trend line due to the cycle alone. Removing the seasonal variations from the data should result in a smaller scatter of points

GRAPHS I-VII



around the trend and a smaller probable error of "*b*." There might be a change in the value of "*b*" if the trend was partly due to the position of the cycle.

In order to determine the cycle, the average of the five points for each calendar month was calculated. These averages, plotted in chronological order, form the irregular line in Graph III. Deviations might be calculated directly from the mean of each month, but the

irregularity of the points indicates that the effects of sampling variation are fairly large. A simple type of sine curve probably would come closer to expressing the underlying cycle. Some areas show a more extended minimum than does Luquillo; some tend to a protracted or even a doubled peak. To allow for some variation without undue complication it was decided to fit routinely a second order Fourier's series, of the type

$$y = A_0 + A_1 \sin(\theta + \alpha) + A_2 \sin(2\theta + \beta)$$

This curve is also drawn in Graph III. It seems to be a fairly good fit: the coefficient of alienation ("k") is 0.386. The parameter A_1(0.8042) is much larger than A_2(–0.2568) indicating that the annual fluctuations are predominantly single-cycle.

The curve value for a calendar month is now subtracted from each of the five corresponding actual monthly figures. This gives a new series of points, plotted in Graph II. The slope of the trend changes slightly to a decrease of 44 per cent a year instead of 48 per cent. The value of "b" is -0.04842 ± 0.00487. The decreased probable error of "b" is illustrated by the somewhat closer clustering of the points around the trend line. The standard deviation of the points around the trend has been reduced from 1.042 to 0.961. More important than the slight reduction in scatter is the fact that the systematic cyclic variations around the trend have been largely removed. There are still consistent fluctuations covering periods of several successive months, but these no longer coincide with a definite time of year. On the contrary, they should express the effects of more or less favorable breeding conditions, without regard to the season.

The data for average trap catches of *A. albimanus* in the "outside" zone were treated identically. Graph V shows the annual cycle and the fitted curve. The fit is not quite so good ("k" = 0.446) and the double cycle plays a relatively greater part in order to take care of the flattened minimum ($A_1 = 0.7557$ and $A_2 = -0.3011$). Deviations from this curve (Graph IV) have a trend which is almost level. "b" $= +0.00341 \pm 0.00516$ which is equivalent to a rate of increase of 4.2 per cent a year. The effect of seasonal cycles here seems to be entirely eliminated.

The difference between the "b" constants of the time trends for the "inside" and the "outside" zones is 7.3 times the probable error of this difference. Since the probability of chance occurrence of so great a difference is of the order of one in a million, it may be stated quite certainly that the level of prevalence of adult mosquitoes was

definitely reduced in the "inside" zone as compared with the "outside."

A second question must now be settled: Is this "outside" zone a good control on the "inside," or might natural conditions have been sufficiently dissimilar to produce a significant difference in their long-time trends? If the latter were the case, then periods favorable and unfavorable to breeding in one zone should not correspond to similar periods in the other. Therefore, after seasonal variations had been removed there should be no correlation between fluctuations around the respective trend lines. Positive correlation of such fluctuations would indicate that natural conditions in the two zones were similar and that the difference in the trends was due to mosquito control work.

The trend lines were fitted by correlation methods in order to obtain the probable errors of the "*b*" constants. It is simple to obtain correlations between mosquito catches in the two zones and to reduce these to correlations of fluctuations by holding "time" constant; *i.e.*, eliminating the effect of the time trends. For Luquillo, the zero-order correlation between adult captures "inside" and "outside" is $r_{aa'} = +0.354 \pm 0.079$. With time held constant, this becomes $r_{aa',t} = +0.521 \pm 0.067$, expressing the correlation of fluctuations around the time trend. The coefficient is not high, but is very definite. Is the correlation spurious, because of the effects of insufficiently removed seasonal cycles or of some other generalized causal agent? If so, similar data from other areas of the island should correlate with the findings in Luquillo.

Graph VI illustrates the monthly deviations of adult catches in the "inside" zone of Santa Isabel from the cyclic curve of Graph VII. The trend again slopes sharply downward; "*b*" $= -0.04518 \pm 0.00541$, a rate of decrease of 42 per cent a year. It differs significantly from the slope of the trend of the Santa Isabel "outside" zone which increases at the rate of 5.8 per cent a year.

The fluctuations around the trend in Graph VI do not, on inspection, bear much relation to those in Graph II. The correlation between them is as a matter of fact only $r = +0.163 \pm 0.091$. The fitted curve of Graph VII is not so dissimilar to that of Graph III that the lack of correlation might be attributed to a basic difference in seasonal cycles.

Discussion: The chief practical object of the analysis is the evaluation of the effects of mosquito control measures carried out over a period of time. As by-products, the method described yields additional items of interest.

The exact time of maximum and minimum mosquito prevalence can of course be determined from the fitted sine curve by differentiation, but slight misfitting of the curve due to sampling variations would lead to large shifts in the calculated maxima and minima.

The difference in levels between maximum and minimum mosquito populations is approximated by the curve. If the parameter A_2 is neglected, twice the value of A_1 measures the distance between the top and the bottom of the curve, in this case the logarithm of the "swing" or constant by which the minimum value must be multiplied to equal the maximum. "Swing" is given in Table I for both adult mosquito captures and for malaria cases, for all areas. In Luquillo "inside," for example, the mosquito population at peak was 5.0 times the population at minimum, while the peak of malaria cases was only 3.5 times the minimum. Disregarding the "outside" zones, where information on malaria was least reliable, it is seen that in every case the "swing" of mosquitoes was greater than that of malaria. This is probably due to the slower motion of the malaria cycle.

The absolute value of the ratio $|A_1/A_2|$ measures the extent to which the fitted curve approaches a simple sine function. The larger it is, the more nearly the cycle is single. This function is also given in Table I. There is a tendency, towards the southwest part of Puerto Rico, to the stretching and duplication of the cycle. The factor "k" or alienation coefficient, measures the goodness of fit of the sine curve. Low values indicate a good fit.

TABLE I

FOURIER SERIES FUNCTIONS

	Adult Captures			Malaria Cases		
	Swing	$\lvert A_1/A_2 \rvert$	k	Swing	$\lvert A_1/A_2 \rvert$	k
Luquillo:						
Inside	5.0	3.13	0.39	3.5	1.49	0.36
Outside	4.5	2.51	.45	8.3	6.04	.40
Fajardo:						
Inside	12.3	3.66	.24	3.5	3.70	.20
Outside	7.5	8.66	.12	4.3	5.11	.26
Pl. Humacao:						
Inside	7.8	1.36	.57	4.2	4.29	.52
Patillas:						
Inside	3.6	7.13	.34	2.1	2.44	.64
Outside	2.9	2.79	.29			
Salinas:						
Inside	3.8	3.32	.64	2.7	2.33	.15
Outside	1.6	0.70	.90			
S. Isabel:						
Inside	3.6	2.47	.56	2.5	4.16	.71
Outside	5.5	3.90	.34			
S. Germán:						
Inside	4.4	1.85	.64	1.4	0.83	.38
Outside	6.6	2.36	.44			

Table II gives values of the time-trend slopes ("*b*" constants) for comparison between "inside" and "outside" zones of the different areas. Playa de Humacao was used for some three years as a study area only, no mosquito control measures being attempted. The tremendous rise in mosquito prevalence and malaria is at least partly due to the effects of a hurricane in 1928. Comparison of mosquito capture trends can be made in six areas. Three show highly significant differences in favor of the "inside" zone. Two other differences are possibly significant. The effects of mosquito control work in Salinas were not demonstrable. Only two areas permit comparisons on the basis of malaria cases. In both, the differences are possibly significant and in favor of the "inside" zone.

TABLE II

SLOPE OF DEVIATIONS AGAINST TIME

	Adult Captures			All Malaria		
	b	Per cent*	Δ/PE_{Δ}	*b*	Per cent*	Δ/PE_{Δ}
Luquillo:						
Inside	−.04842 ± .00487	−44.1	7.3	−.02930 ± .00455	−29.6	2.9
Outside	+.00341 ± .00516	+ 4.2		−.00629 ± .00657	− 7.8	
Fajardo:						
Inside	−.02323 ± .00362	−24.4	2.7	−.01139 ± .00204	−12.8	3.7
Outside	−.01121 ± .00270	−12.6		+.00127 ± .00274	+ 1.5	
Pl. Humacao						
Inside	+.07762 ± .01387	+153.8		+.02497 ± .00630	+35.0	
Patillas:						
Inside	−.06755 ± .00855	−55.5	3.2	−.02572 ± .00367	−26.5	
Outside	−.03390 ± .00628	−33.5				
Salinas:						
Inside	−.02584 ± .00495	−26.6	0.8	+.01021 ± .00177	+13.0	
Outside	−.02043 ± .00520	−21.8				
S. Isabel:						
Inside	−.04518 ± .00541	−41.9	6.3	−.04003 ± .00542	−38.1	
Outside	+.00469 ± .00582	+ 5.8				
S. Germán						
Inside	−.04085 ± .00605	−38.8	8.3	+.00434 ± .00659	+ 5.3	
Outside	+.02862 ± .00576	+40.9				

* Per cent annual change corresponding to value of *b* constant.

Fluctuations around time trends may be correlated for different factors in the same area or for different areas. In Table III are given correlation coefficients of various factors for different areas, the time trend in each case being eliminated. Mosquito populations in "inside" and "outside" zones appear to show definite correlation throughout. There is no consistent relation between mosquito numbers and malaria cases. The correlation, in fact, at times becomes definitely negative. The course of malaria endemicity is a much slower and more gradual affair than the variation in mosquito popula-

tion and may depend on a number of other factors. The correlations of malaria cases "inside" and "outside" in Luquillo and Fajardo do indicate that common factors were operating in the two zones.

TABLE III

CORRELATIONS OF FLUCTUATIONS AROUND TRENDS

	Inside Adult Catches and Inside Malaria	Inside Adult Catches and Outside Adult Catches	Outside Adult Catches and Outside Malaria	Inside Malaria and Outside Malaria
Luquillo	+0.385 ± .078	+0.521 ± .067	—0.048 ± .091	+0.496 ± .068
Fajardo	—0.015 ± .083	+0.259 ± .076	—0.017 ± .081	+0.159 ± .074
Pl. Humacao	+0.106 ± .107			
Patillas	+0.390 ± .085	+0.494 ± .077		
Salinas	—0.338 ± .078	+0.381 ± .086		
S. Isabel	—0.266 ± .086	+0.433 ± .084		
S. Germán	—0.156 ± .098	+0.256 ± .096		

SUGGESTED PROBLEMS FOR MATHEMATICAL RESEARCH

By Burton H. Camp

The following list of problems is suggested as the result of a letter sent out to about three hundred members of the Association, all of whom had exhibited recent interest in research, principally of the so-called practical type. The letter suggested that the practical worker had problems which the mathematician ought to be working at and that mathematicians would be glad to work on them if they might be told what they were. Mathematicians were constantly being accused of being out of touch with things that really mattered, but if that was true, it was not because they preferred to be.

Some of the suggestions that members were good enough to send do not appear on this list. Many of them have had their forms altered more or less, in some cases perhaps so as to become unrecognizable to those who sent them. This has been necessary in order to present what seemed to be the underlying mathematical problems that were really holding up progress, although they may not have been put initially in such concrete forms. The author has made some progress on almost all of these problems himself, *i.e.*, in each case he has pushed the analysis far enough to be confident that the problem will not simply fade out when looked at closely. In none of the cases presented here, however, does he now have a complete and satisfactory solution. Occasionally a solution developed after a little study; in such a case the solution was sent back to the sender and the problem does not appear here. It is quite likely that solutions of some of the others have actually been published, for the original list comprised such a wide variety of fields that it was not possible to search the literature carefully in all cases.

1. Explore the mathematical background of Spearman's g factor theory and of the Thurstone multiple factor theory.

Probably what the proposer wishes is now available in the literature, in view of recent papers. The two theories are related but are quite distinct in important respects. Hotelling has analysed the multiple factor theory. It has been shown by several writers that Spearman's conditions for g are not sufficient to show that the individual possesses this character in the sense that it has a single, fixed value for him; but it is true that, if he does have it, the usual formulae are capable of determining its value, often within a small probable error.—(Further oral comment on this with special reference to forthcoming papers by Piaggio and Irwin.)

2. Let a universe consist of four categories, A, B, C, and D.

What is the probability of a sample of given size in which the number of A's and B's together shall be a prescribed number x, and the number of B's and C's together shall be a prescribed number y?

The solution can be written in the form of a finite series, but the author has not been able to sum this series. This problem came up first in connection with a sociological survey in which the proportions of A, B, C, and D in the universe were known separately, but in the samples only the proportions $A + B$, $B + C$, and D were known. The complete solution would also answer a question like the following. Let A and B denote the number of individuals *of the type* who in 1930 died before age 30, B being those dying of cancer. Let C and D represent those dying after age 30, C being those dying of cancer. Could the data gathered 50 years earlier, which showed a larger percentage in the classes A and B together, but could not show A and B separately, have been a random sample from a universe like the 1930 universe so far as the number of cancer cases (B plus C) was concerned? The reason the data of 1880 could not show the number in A and B categories separately is that the number of persons then of type A is quite different from the number of persons then dying before age 30 of other diseases than cancer.

3. Let y denote a time series which is known over a long period, and y' what is left of y after deducting its straight line trend. Let z represent another time series which is known over only a short portion of this period. Devise a trend line for z so that, if z' be what is left of z after subtracting this trend, the correlation between y' and z' shall be a maximum.

4. *The Trend.* Consider the objectives sought in drawing a trend line or a trend curve. (a) Suppose the purpose is to summarize the data as succintly as possible, except for chance deviations. Then the trend should be fitted so that successive residuals are independent. An approximate way to do this would be to make them have minimum correlation. For a straight line trend this is equivalent to the usual least square determination, but this is not true for curvilinear trends. Study the question for curvilinear trends. (b) If the objective is to find out what would happen if the yearly change should continue as it has on the average in the past, a straight line trend is indicated. If the objective is to find out what would happen if the percentage yearly change should continue as it has on the average in the past, then an exponential trend is indicated. What are the corresponding hypotheses underlying polynomial and other curvilinear trends to justify their use? (c) One author appears to desire a trend curve which shall have the property that it bends slowly, except under unusual circumstances. What would be the best type of equation to use for this purpose? (d) Consider the advantages in using trend surfaces, functions of two variables, $z = f(x,y)$, instead of writing first the customary function of one vari-

able, $z = f(x)$, and then expressing the residual as a function of another variable, $z - f(x) = F(y)$. (e) Study further the effect of sampling from a universe in which successive individuals are correlated, as in a time series.

But the solutions of (e) given by Rhodes and C. C. Craig are pretty complete. If the problem of (a) were solved, this question might not need to be put.

5. Develop further the theory of small samples. Write a monograph giving the important results to date with the theoretical background of each.

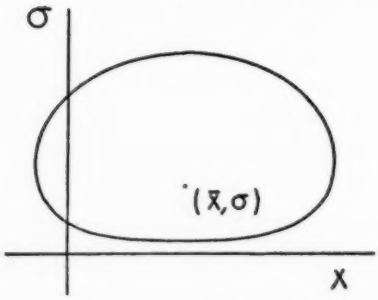
Tippett's recent book is good. The practical worker has probably been misled into expecting too much of small sample theory. It is not true that Fisher's results can be applied, to answer the practical questions usually at issue, as confidently to small samples as to large ones. Assumptions kindred to those manifestly present in the older theory have to be made. It is true that we are now in a position to deal confidently with the mean of many small samples, but not with a single small sample. This is an important matter and controversial. Therefore it is necessary to pause at this point and defend briefly the statements just made.

Consider the simplest of such problems, namely the reliability of the mean. One has in practice a sample $x_1, x_2, \ldots, x_n$ of which the mean is $\bar{x}$, and the standard deviation is σ. One is willing to assume that this sample came from some unknown normal universe specified by x' and σ'. The problem is to inclose $\bar{x}$ within an interval (a, b) and to indicate the degree of assurance with which one can assert that x' is in (a,b). According to the older method, if σ' were assumed known, the probability of a mean greater than a specified number could be determined accurately even for small samples, but since for small samples the size σ' could not be estimated closely from the sample, this probability was in doubt. According to Student's method, now commonly cast in Fisher's notation, since the probability of a t greater than a specified number, where $t = |x' - \bar{x}|/\sigma$, is known exactly for each x', we are required to reject x' when this probability is small, say as small as one per cent. This obviates one of our earlier difficulties, and has seemed to some a perfect solution, but let us examine it more closely.

What we would really like would be a criterion which would reject x' if it would mean that a very improbable *sample* had been observed. What we have apparently got is a criterion which would reject x' if it would mean that a very improbable t had been observed. This is a different matter, since the same t can obviously pertain to different samples. The problem has been rather thoroughly analyzed in recent articles by Neyman and E. S. Pearson. They soon found that an anterior problem should be solved first, namely: To inclose the point $(\bar{x}, \sigma)$ within a closed curve and indicate the degree of assurance with which one can assert that the point (x', σ') is within that curve. The probability of obtaining this sample $(x_1, x_2, \ldots, x_n)$ from any prescribed universe (x', σ') is proportional to what they call the probability density of the sample,

$$D = \frac{1}{\sigma' \sqrt{2\pi}} e^{-\frac{N}{2\sigma'^2}[(x^1 - \bar{x})^2 + \sigma^2]}$$

If we could inject universes for which this is small, we would have a very simple answer to our problem, for D is constant on closed contours like the one in the figure. We should then reject universes outside that contour on



which D maintained a certain acceptable smallness and keep the rest. But D is extremely small anyway and we do not know how to choose the critical contour or, choosing it, how to interpret our action simply. Therefore Neyman and Pearson introduced at this point artificial elements and pursued two different and equally arbitrary hypotheses. One leads ultimately to Fisher's t-test indicated above; another to what Fisher's t-test would be if N were replaced by N–1. If N is small the difference between the two is substantial. For example, if $N = 6$ and Fisher's $P(t) = .01$, the interval (a, b) would be increased by 29 per cent if N were changed to N-1. This is comparable with a decrease of 36 per cent if one used the older method and chose σ' by putting σ^2 equal to the mean value of σ^2 in samples of 6.

The most natural hypothesis to make is neither of those explored by Neyman and Pearson, but the following: Choose for the critical contour that one which will lead to the result that when universes outside of it are rejected then a true case will be rejected in only a small percentage, say one per cent, of trials. (*I.e.*, one per cent of samples from any given universe will lead to a value of the criterion which will cause the universe to be rejected.) But unhappily the contours for which this obtains are different for different σ''s, so that we are now up against our old difficulty: we need to know at least approximately the value of σ' before we start. In spite of all that has been done on this primary problem it has not yet been solved for small numbers. If N is large our practical troubles disappear and all methods yield practically identical results.

6. Explore the subject of demand curves and allied topics.

This is a field of study which in the opinion of several authors mathematicians should consider.

7. Study further the various approximations to the incomplete Beta function, indicating their ranges of applicability.

Perhaps rendered unnecessary in view of Pearson's tables of this function; just published.

8. *Curve Fitting.* (a) Devise better methods of fitting the arc tangent curve. (b) The same for other S shaped curves.

Since S shaped curves are usually integrals of frequency curves, the problem is the same as that of fitting the successive differences in the table of the given data to a *part* of a frequency curve.

(c) Extend the use of specially designed scales so as to reduce the problem of curve fitting to that of fitting graphically a straight line. Is there a convenient method of doing this in space of three dimensions for the cases where there are three parameters to be de-

termined? (d) Find a less difficult method than that of least squares for fitting a part of a normal surface to a set of points. (e) Make use of the least absolute value criterion, instead of the least square criterion, in fitting a trend line.

The references in Whittaker and Robinson's *Calculus of Observations*, page 259, are valuable. This problem is sometimes indeterminate; it is a generalization to two dimensions of the problem of devising an analytic formula for the median. Perhaps the practical objective—which is to reduce the weight given to outlying observations—may be attained by a second application of the least square method, reducing the weights of the observations that appear distant after the first application.

(f) One author desires a method of fitting a curve of given form to a scatter diagram so that the sum of the squares of the normals drawn to the curve shall be a minimum.

The problem has been solved for a straight line.

9. Australian ballot problem. Suppose x persons express their preferences for articles, a, b, and c in the order a, b, c; y persons express their preferences in the order, a, c, b; z persons indicate a third order; and so on. If the prices of a, b, and c are p, q, and r, respectively, what relative volume of output will produce the maximum return?

It is obviously necessary to decide what assumptions should be made as to the distribution of the degrees of preference for each class of possible purchasers, and the relation between the individual's degree of preference for an article and his willingness to pay an extra price for it.

10. More mathematical study of genetic theories is desired, with special reference to the problem of the stability of population characters.

11. An educator wishes to compare the efficiencies of two methods of teaching a subject. One student makes a gain of 5 from an initial score of 50; another makes a gain of 5 from an initial score of 70. How should the relative significance of these two gains be rated?

Educators are not agreed on this and use different techniques. It seems to be partly a matter of definitions and partly a matter of choosing the most suitable hypotheses.

12. The Census Bureau suggest further study of the possibility of making sample enumerations.

Cf. Coats, this JOURNAL, vol. 26, also Neyman, "The method of stratified sampling and the method of purposive selection," *Journal of the Royal Statistical Society*, 1934, page 558. An interesting problem of very practical nature.

13. "What can we learn from frequency distribution analysis concerning the essential stability or instability of populations (*e.g.*, price

relatives)? Research on the mathematical side might be a great help to economists, and to other social scientists."

> The mathematician may be inclined to doubt the hypothesis that stability is connected with any special frequency form, but at least he can tell what are the characteristics of such price changes and of such changes of the base of price relatives as would leave a given form unchanged. If stability is connected with a special frequency form, it would seem that it must have certain invariant properties such as these.

14. Hotelling's list of problems (read at Princeton) should be remembered in connection with these. To avoid unnecessary repetition none of these have been repeated here, although he very kindly put them at the author's disposal, and although references to some of them have come from other sources.

ANALYSIS OF COVARIANCE OF STATISTICALLY CONTROLLED GRADES

By George W. Snedecor

In 1928, the head of the Mathematics Department at Iowa State College, Professor E. R. Smith, determined to institute some kind of statistical control of the departmental grading system. He had found that two classes, apparently equal in ability and accomplishment, had been assigned grades averaging 86 and 74 respectively and realized that grave injustice might result from such discrepancies. A series of tests was devised upon which was based an ability score for each student. This ability score is really an estimated grade obtained by the methods of multiple regression. It is used for two purposes; the students are sectioned according to ability and the average grade of each class is required to tally closely with the average ability grade. This constitutes the statistical control now in effect.

In 1932, after a change in the college grading system, the results of the grading were re-examined. Preliminary statistics are shown in Table I. The evidences of sectioning according to ability may be

TABLE I

STATISTICS OF 14 CLASSES IN FRESHMEN MATHEMATICS, FALL QUARTER, 1932, IOWA STATE COLLEGE

Class	Number in class	Mean ability score A	Mean final grade M
1	17	5.00	4.12
2	20	2.55	2.55
3	20	1.95	2.45
4	19	2.84	3.11
5	17	2.18	2.47
6	21	2.33	2.24
7	18	2.94	2.94
8	18	4.17	4.22
9	20	3.05	2.90
10	20	3.20	3.25
11	21	3.33	3.14
12	21	2.33	2.05
13	19	0.95	1.47
14	20	3.00	2.50
	271	2.82	2.79

noted in the high ability Classes, 1 and 8, and the low, 3 and 13. There may be noted, also, a decided regression in the final grades—the students of high ability fail to live up to expectation, while those less favored receive grades above their estimated abilities.

An analysis of the covariance of the scores and grades in Table I has been reported.[1] It is the object of this paper to extend the analysis according to the newer theory of Bartlett.[2] Before doing that, however, it is necessary to recapitulate the results obtained by the earlier method of R. A. Fisher.[3] Those results are displayed in Tables II and III. For the first of these tables, the sums of squares

TABLE II

COVARIANCE OF ABILITY SCORES AND MATHEMATICS GRADES

Source of variation	Degrees of freedom	Sums of squares and products			Correlation coefficients	Regression coefficients
		SA^2	SAM	SM^2		
Total	270	391.50	304.08	464.43	0.7131	0.7767
Between classes	13	224.06	161.92	134.06	0.9343	0.7227
Within classes	257	167.44	142.16	330.37	0.6044	0.8490

and products are calculated from the primary data in the usual manner and combined into correlation and regression coefficients. For calculating the sums of squares of errors of estimate in Table III, that is, the "adjusted" sums of squares, only the regression *within classes* is used. The mean squares in the last column of the

TABLE III

OLD METHOD OF COMPUTING VARIANCE OF ESTIMATES USING ONLY REGRESSION WITHIN CLASSES

Source of variation	Degrees of freedom	Sum of squares of errors of estimate	Mean square of errors of estimate
Total	269	230.29	0.8561
Between classes	13	20.61	1.5858
Within classes, from pooled regression	256	209.68	0.8190

table represent the amount of variation in the several groups after the regression of grade on ability has been duly discounted. More specifically, the mean square between classes arises from the failure of the class mean grades to lie on the *within class* regression line. Since it was only the regression *within classes* that was used for computing errors of estimate, but one degree of freedom was sacrificed

[1] Snedecor, George W., *Calculation and Interpretation of Analysis of Variance and Covariance*, Collegiate Press, Inc., Ames, Iowa (1934).

[2] Bartlett, M. S., "The Problem in Statistics of Testing Several Variances," *Proceedings of the Cambridge Philosophical Society*, XXX, 2:164 (1934).

[3] Fisher, R. A., *Statistical Methods for Research Workers*, Oliver and Boyd, Edinburgh, Fourth Edition (1932).

from this group, *within classes,* and none from the group, *between classes.*

Bartlett believes that the sums of squares, *within classes* and *between classes,* each tap two sources of variation. Consider first the sum of squares *between classes.* He finds that this sum contains a portion which may be attributed directly to the difference,

(regression between classes)—(regression within classes).

The remaining portion is an estimate of the variance of estimate of the class means from the regression *between classes.* This part of the problem is solved by adjusting each group of effects by its own regression. Each sum of squares of deviations from regression is given very simply by $SM^2 - (SAM)^2/SA^2$. For example, the adjusted sum *within classes* is $330.37 - (142.16)^2/167.44 = 209.67$, as before. That *between classes* is $134.06 - (161.92)^2/224.06 = 17.05$. The results are recorded in the first three lines of Table IV. Each

TABLE IV

FIRST STEP TOWARDS BARTLETT'S COMPLETE ANALYSIS OF THE VARIANCE OF ESTIMATE

Source of variation	Degrees of freedom	Sum of squares of errors of estimate	Mean square of errors of estimate
Total	269	228.25	
Between classes	12	17.05	1.42
Within classes, from pooled regression	256	209.67	0.82
Difference between regressions	1	1.53	1.53

effect now loses a degree of freedom owing to the adjustment. There remains a single degree of freedom accompanied by a remainder in the sum of squares, 1.53. Bartlett shows that this is an unbiased estimate representing the difference between the two regressions, *within classes* and *between classes.* The slopes of the two regression lines, within classes and between classes, differ little, and, as will be shown later, non-significantly. This means that abilities of students in the classes correspond with their final grades in much the same manner that average class abilities correspond to class final grades.

In order to segregate the two sources of variation in the sum of squares *within classes* adjusted by the pooled regression, Bartlett next proceeds to examine the regressions in each of the classes. The necessary computations are presented in Table V. The degrees of freedom in the classes are those remaining after adjustment for regression, *i.e.,* less by two than the number of students comprising the class.

TABLE V

DETAILS OF COMPUTATION OF ADJUSTED SUMS OF SQUARES IN 14 CLASSES

Class number	Degrees of freedom	SA^2	SAM	SM^2	Correlation coefficients	Regression coefficients	Adjusted sums
1.....	15	0.00	0.00	15.76			15.76
2.....	18	6.95	5.95	14.95	0.58	0.86	9.86
3.....	18	12.95	11.45	28.95	0.59	0.88	18.83
4.....	17	20.53	20.32	29.79	0.82	0.99	9.68
5.....	15	12.48	6.59	16.24	0.46	0.53	12.76
6.....	19	18.67	13.33	27.81	0.58	0.71	18.29
7.....	16	10.94	6.94	14.94	0.54	0.63	10.54
8.....	16	2.50	1.33	9.11	0.28	0.53	8.40
9.....	18	12.95	13.10	27.80	0.69	1.01	14.55
10.....	18	11.20	13.00	23.75	0.80	1.16	8.66
11.....	19	12.61	15.00	28.57	0.79	1.19	10.73
12.....	19	26.67	21.67	36.95	0.69	0.81	19.34
13.....	17	4.95	—2.53	22.73	—0.23	—0.51	21.44
14.....	18	14.00	16.00	33.00	0.74	1.14	14.71
Totals...	243						193.55

The correlation coefficients vary from —0.23 to 0.82. The regression coefficients run from —0.57 to 1.19. The question immediately arises whether these variations may be attributed to random sampling from a homogeneous population, or whether the instructors differed significantly among themselves in judging the attainments of groups of equally able students. The completed analysis of variance of estimate furnishes not only the answer to this question, but also an improved estimate of experimental error.

The final form of the analysis of the variance of estimate is displayed in Table VI. The last two lines of the table contain the

TABLE VI

COMPLETED ANALYSIS OF VARIANCE OF ESTIMATE, BARTLETT'S METHOD

Source of variation	Degrees of freedom	Sum of squares	Mean square
Total	269	228.25	
Between classes	12	17.05	1.42*
Between regressions	1	1.53	1.53
Between class regressions	13	16.12	1.24
Within classes, from individual class regressions	243	193.55	0.7965

* Significant.

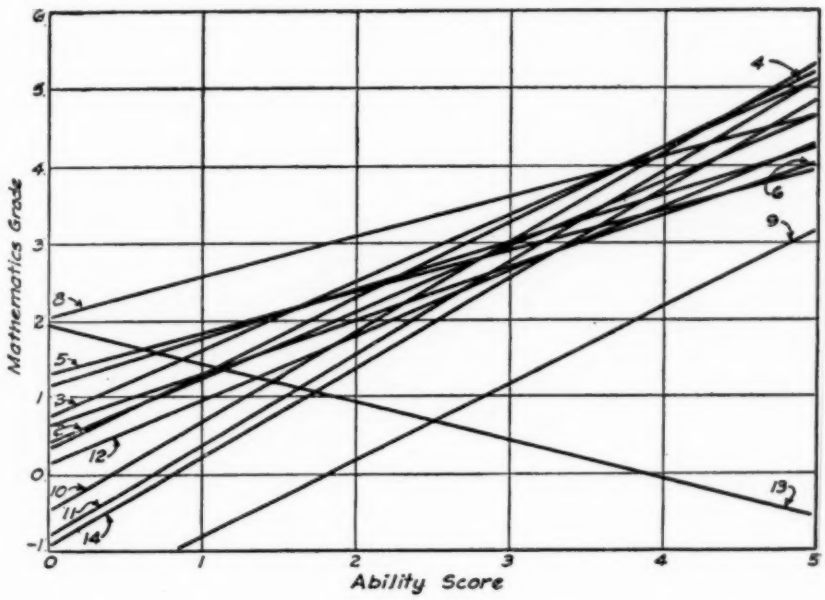
new information derived from the individual class regressions. The degrees of freedom and sums of squares in these lines result from Tables IV and V in this manner:

Source of variability	Degrees of freedom	Sum of squares
Within classes, from pooled regression, Table IV.....	256	209.67
Within classes, from individual regressions, Table V.....	243	193.55
Difference, between class regressions	13	16.12

Chart I displays the individual regression lines of 13 of the classes. With the exception of that of Class 13, there is little to distinguish them. In Class 13 the final grade of the students actually went up as their ability scores decreased. The instructor of this class seems to have concentrated his attention on the dull and mediocre students, neglecting those of greater ability.

CHART I

REGRESSION OF MATHEMATICS GRADES ON ABILITY SCORES, 13 CLASSES



As estimates of experimental error, there is little to choose between the mean squares *within classes* in Tables III and IV. They usually do not differ greatly. The latter is freed from all known sources of variation, and would seem to be the more satisfactory in the usual situations. If the other mean squares in Table VI are tested against that *within classes,* only one is found significant, the one *between classes,* and it is just at the 5 per cent point. The meaning is that the class average grades depart significantly, but not greatly, from the regression in this group and the statistical control of the grading system was not entirely successful. The instructors of Classes 3 and 4 probably overestimated the attainments of their students, while those of Classes 1, 12, and 14 erred in the opposite direction.

The class regressions do not differ significantly among themselves

despite the freakish Class 13. However, if this latter regression is isolated and tested against the others *en masse,* the F-value far surpasses the 1 per cent point. There is some evidence that the regressions of grade on ability are usually S-shaped instead of linear. This has not been considered in the present treatment. Experimental error, therefore, may be somewhat larger than necessary.

Fisher, in his fifth edition just off the press, does not accept all of Bartlett's findings. He introduces a test for significance to be applied to the mean square error of estimate between classes. In the problem of grades discussed in this paper, Fisher's test of significance yields results almost identical with that of Bartlett. In other situations, however, the results of the two tests may differ radically. Bartlett [4] and Wishart [5] have extended their methods of analysis of variance of estimate to include the cases of (i) more than one criterion of classification, (ii) more than two variables, and (iii) only two classes in one or more of the effects. In the analysis of data, the utility of these methods is outstanding.

[4] Bartlett, M. S., "The Vector Representation of a Sample," *Proceedings of the Cambridge Philosophical Society,* XXX, 3; 327 (1934).

[5] Wishart, John, University of Cambridge. His results were personally communicated during the summer of 1934.

A STUDY OF TWINS AS A METHOD OF INVESTIGATING NATURE AND NURTURE

By Frank N. Freeman

We may conceive the relative share of heredity and environment in two ways. In the first place, we may seek to determine the relative share of each of these two sets of factors in determining the characteristics of an individual. This is the way we ordinarily think of it. The other form of the question considers, not a single individual, but a group of individuals. It is clear that the problem as stated in the first form can only be solved by investigating the problem as formulated in the second statement. That is, we cannot determine the composition of the characteristics of a given individual except on the background of a comparison of various individuals with each other. The determination of any characteristic is always relative.

It would be an idle waste of time to discuss whether heredity or environment is the essential factor in producing variations. All competent students of the question now recognize the fact that both heredity and environment have an influence or are essential in order that this development may take place at all. The question, then, becomes one of degree.

As was stated, the problem is to determine the effect of variations in heredity, on the one hand, and variations in environment, on the other hand, in producing variations between individuals. It will be evident that an exact definition of the problem would involve a statement of the range of variations in heredity and the range of variations in environment which are to be considered.

Certain approaches may be made to the problem:

(1) Resemblances of persons of different degrees of genetic relationship without control of the environment: The genealogical studies made by Galton, Dugdale, Woods, Goddard, and others, fall under this head.

(2) Comparisons between groups which may differ in either heredity or environment or both: Many comparisons have been made between groups of persons to determine the variation between them and conclusions have often been drawn concerning the relative influence of environment and heredity based on these comparisons. Among the groups which have been compared are the following: residential groups, racial groups, occupational groups, occupation of parents, immigrant groups, intelligence of parents, amount of schooling.

It is evident that all of these comparisons suffer from the fact that an independent determination of the effect of the variation of either heredity or environment is not made. Either factor may vary, or both may vary concomitantly. It is, therefore, impossible to assign the variation between the groups to either of the two factors or to any particular combination of them.

(3) Comparisons in which the environment remains relatively constant while the degree of genetic resemblance varies: This condition is satisfied in the comparison of the differences between identical and fraternal twins or between twins and siblings. If, for example, we compare identical twins and fraternal twins we can ascribe the difference largely to the greater genetic resemblance of identical twins because the difference in the environment is about the same.

(4) Comparisons in which heredity is relatively constant or balanced and the environment varies: This condition is satisfied with some degree of precision in certain studies of foster children. For example, we may test the foster child before and after being placed in the foster home. A second comparison of foster children of somewhat similar heredity but different environment is made by a comparison of the intelligence of siblings placed in different foster homes. A third method is to find the correlation between the ability of foster children and the grade of the home in which they are placed. The final and most conclusive comparison which we have thus far been able to devise, short of experimental procedure, is the comparison of identical twins who have been brought up under different environments. This gives a perfect control of the genetic factor.

Nineteen pairs of identical twins separated in infancy or very early childhood have been studied. The examination lasted approximately two days and included a set of rather detailed physical tests and a battery of mental and educational tests. The mental and educational tests included four intelligence tests, a composite battery of educational tests, four tests in the general field of personality, and the handwriting. I shall confine myself to a description of three of the selected cases.

Case Number 9. H. R. and H. S. are twin brothers who, though brought up separately, have lived in very similar environments and are similar in ability and personality. These brothers were nineteen years old at the time of examination. Although they have lived in separate homes, their homes have been only three miles apart and they have attended the same high school. One has lived in a small village and the other on a farm. Both have had the same amount of schooling, but H. R. graduated a year later than H. S. and had,

therefore, been out of school a shorter period when they were tested. H. R. attended a good village school throughout the elementary grades and H. S. a country school with only one room. This may also have given H. R. some advantage. H. S. spent a year less in the elementary school and probably did not receive as thorough a training as did his brother. The two homes are very similar in general cultural level. Both are homes of relatives.

H. R. was somewhat superior to H. S. in the four tests of intelligence and in the comprehensive educational test. In all but one of the tests his superiority was from one-half to three-quarters of the average difference of all the nineteen pairs. In one of the four intelligence tests his superiority was somewhat greater than the average difference.

The tests of personality show some remarkable similarities. On the Downey Will-Temperament Test the patterns are very closely similar. Both make a relatively low score on the Woodworth-Mathews Personal Data Sheet, which indicates that both are relatively stable in their nervous reactions. H. R., however, makes a somewhat higher score than does H. S., which agrees with the results of the Bernreuter Test given by Dr. Park of the University of Wisconsin. The Pressey Test of the Emotions seems to contradict these findings in that H. S. makes a higher score, indicating greater emotionality. The results of this test do not seem to be as consistent as the others, however, and this finding may be discounted. The average frequency on the Kent-Rosanoff Free Association Test is almost identical, though H. R. gives a somewhat higher number of common responses. In general, the responses on this test are rather similar. The handwriting of these brothers is very similar. The two specimens might have been written by the same person in somewhat different physical or nervous conditions.

On the whole, these brothers with very similar environment are also similar in ability and in personality. H. R., with somewhat more favorable education, makes a somewhat higher score on the ability tests and also seems to be slightly less stable nervously. The relatively close similarity of these brothers may serve as a base from which to compare others in which greater differences are found.

Case Number 8. M. S. and R. S. are sisters sixteen years of age with similar schooling but very different home environments and marked differences in ability and personality. M. S. was reared in the home of a maternal uncle who was a prominent man in a large town. R. S. was taken by a family who lived in a large city at a distance from M.'s home. The advantages of this home were

meager and R. was rather jealously guarded by her foster mother and prevented from making many social contacts outside the home. M. S., on the other hand, was given every advantage not only by her foster parents but by an aunt who is a teacher in the high school. Her schooling and social life were supplemented by the study of music. She has been an inveterate reader and has the advantage of a well chosen library.

In all the tests of ability M. S. is decidedly superior. Curiously enough, her superiority is greatest in the intelligence tests and least in the educational test. This is, perhaps, due to the fact that her advantage is not in formal schooling but in the character of her general intellectual environment.

The patterns on the Downey Will-Temperament Test are very similar except at four points. Our interpretation of the differences on these four points is that M. S. is more flexible in her reactions and has better control over her behavior. R. S., on the other hand, is more inhibited. This inhibition may indicate lack of self-confidence. For example, in the self-ratings which are made on the first part of this test, R. S. rates herself as having inferior intelligence, inferior character, as being slow, and having seven other undesirable traits. M. S., on the other hand, rates her intelligence and quickness as average, her character as above average, and she does not indicate that she possesses any other undesirable traits. On the Woodworth-Mathews Personal Data Sheet R. S. gives eight more unfavorable responses than does M. S. While M. S. marks more words on the Pressey Emotions Test, seeming to indicate greater emotionality, she does not mark any more on that part of the test which indicates worries. Her responses on the Kent-Rosanoff Test are more like those of people in general than are R. S.'s. Marked differences appear in the handwriting. M. S.'s writing is larger and more spread out. It is also freer and more fluid.

In this case, then, the difference in the environment has evidently produced a marked difference in general intellectual ability as well as definite differences in personality and behavior.

Case Number 11. G. S. and H. B. illustrate extreme difference in schooling reflected in very large differences in both ability and personality. These sisters, thirty-one years old when examined, were separated at eighteen months and did not meet again until they were twenty-eight years of age. One has had only two years of formal schooling and the other has graduated from college. The first, G. S., has worked up to a clerical position, and the second, H. B., is a teacher.

The superiority of H. B. on the tests of ability is from one and one-half to four times the average difference. The difference in *IQ* on the Stanford-Binet Test is twenty-four points and the difference on the Stanford Achievement Test is sixty-nine months.

The difference in the patterns on the Downey Test suggests that the environment has produced differences in behavior. In the middle part of the scale the patterns are very similar. At both ends, however, they differ radically. H. B. makes much higher scores in speed and fluidity of movement, and very much higher in the tests indicating motor control and interest in detail. There appears to be a rather profound difference in speed and flexibility and control of responses. The scores on the tests of nervous stability are not entirely consistent. Both cross out a very large number of words on the Woodworth-Mathews Test, suggesting neurotic dispositions. G. S. makes a higher total score on the Pressey Emotions Test, but H. B. crosses out more words in Test IV, which indicates worries. The responses are very similar on the Kent-Rosanoff Test. On the whole, the differences in those tests which indicate emotionality are much less than those on the tests of ability or of will-temperament, which are extreme.

These are three cases chosen to illustrate the different types of relationship between environment, on the one hand, and ability and personality, on the other. These studies indicate a diversity of effect due to the diversity of the conditions. Some of the relationships between environment and ability or personality which appear rather evident come out more clearly in the detailed analysis of individual cases than in the statistical formulation of the results. The interpretations which we may make on these case studies do not, of course, have the appearance of certainty and proof which attaches to the statistical comparisons and analyses. When they are backed up by the evidence of these statistical analyses, however, they are worthy of some credence and they give a picture of the detailed relationships which is blurred in the more abstract and general statistical comparisons. They give, moreover, a concreteness which helps us to understand how the environmental factors may operate and which may, therefore, give some additional credibility to the statistical findings themselves.

THE STATISTICAL EVALUATION OF NATURE AND NURTURE

By Karl J. Holzinger

As already indicated by Professor Freeman in the preceding paper, the groups used in our studies comprise three sets of twin pairs. The group designated as "fraternal" includes fifty pairs of such twins reared together; the group called "identical" includes fifty pairs of identical twins also reared together; the last group known as "separated" cases consists of twenty pairs of identical twins, separated in early infancy and reared under very different environments.

A large number of physical and mental tests were given to all of these twins, but only a few tests will be cited here for illustration. These include: height, weight, head length, total finger ridges on both hands, Binet I. Q., International Intelligence Test, Stanford Achievement Test of general academic learning, Woodworth-Mathews test of nervous instability, arithmetical computation, and speed of tapping.

A number of special ratings were made of the third group. Five competent judges were asked to read carefully the detailed case histories of the twenty "separated" pairs, prepared independently by Professor Newman. The difference in educational, social, and physical environment was then rated on a scale of 1 to 10 for each separated pair of twins. The descriptive material used in these ratings was very complete and it is believed the pooled ratings of the judges afforded good estimates of these three types of environmental difference.

The reliability of the ratings was highly satisfactory, the pooled judgment of five raters exceeding .90 for each type of environment. It was also found that the three types of environment were relatively independent. Thus the social and physical ratings showed a correlation of only —.02, and educational and physical had a correlation of .17.

For certain twin characters, differences between separated pairs were correlated with the pooled rating of differences in educational, social and physical environments. These correlations are presented in Table I. Using Fisher's table *VA* with $P=.05$ as a standard, we may regard all correlations less than .45 as insignificant; using $P=.10$ gives correlations less than .38 an insignificant; correlations in the range .38 to .45 may then be reviewed as doubtful.

TABLE I

CORRELATIONS OF TWIN DIFFERENCES IN CERTAIN TRAITS WITH ESTIMATED DIFFERENCES IN ENVIRONMENT

Trait	Environmental difference rating		
	Educational	Social	Physical and health
Height	—.02	—.01	—.18
Weight	—.10	.23	.60
Head length	—.14	—.26	—.10
Binet I. Q.	.79	.51	.30
International Test	.46	.53	—.03
Stanford Education	.91	.35	.14
Woodworth	.05	—.08	—.29

The only significant correlation of physical difference with environmental difference is that between weight and physical difference. This correlation of .60 is expected since superior physical and health conditions should produce gain in weight.

In the case of the intelligence tests, there are significant correlations .46 to .79 with educational environment. These tests also correlated with social environment .51 to .53, but not with physical differences.

Finally, the Stanford Achievement Tests show high correlation (r=.91) with rated educational differences in environment and some possible correlation (r=.35) with social differences. The former correlation is again in line with ordinary expectation since several years of superior schooling of one twin over the other should produce marked differences in achievement.

Taken as a whole, these correlations indicate that changes in educational, social, and physical environment may produce undesirable changes in intelligence, scholastic achievement and certain physical characters such as weight.

From the intercorrelations of the above variables we may make an analysis of the contribution of environmental factors to Binet I. Q. differences by the method of path coefficients. We thus find 50 per cent attributable to educational differences, 10 per cent to social differences, 12 per cent to joint educational and social differences, 9 per cent to physical differences, and 19 per cent to unknown causes.

Omitting the four pairs of twins with extreme differences in environment we find 1 per cent attributable to educational differences, 16 per cent to social differences, 3 per cent to joint educational and social differences, 12 per cent to physical differences, 4 per cent to joint educational and physical differences, and 64 per cent to unknown causes.

Some of the correlations used in the above analysis are insignificant and some of the resulting percentages are also doubtful. Certain broad conclusions, however, may be drawn from the above comparisons. When all cases were used, the separate and joint educational and social differences account for some 72 per cent of the variance in I. Q.; when the four extreme pairs are omitted, however, these environmental factors account for only 20 per cent of the I. Q. variance. This suggests that moderate environmental differences produce inappreciable effect upon twin characters, and that relatively great environmental differences must be present to produce noticeable effect upon traits such as here studied.

For the twenty pairs of identical twins reared apart and for the fifty pairs of identical twins reared together, we may compare the twin differences for several physical and mental characters. We may symbolize the genetic factor, corresponding to "nature" by G. This is assumed to be the same for an identical twin pair because of their monozygotic origin. The "nurture" factor offers more difficulty because of the possibility of including pre-natal and other developmental factors under "environment." For the present we shall denote external environmental influence by the symbol E, and use N to indicate all other non-genetic factors which operate to produce changes in characteristics. Differences for the three groups of twins may then be symbolized as follows:

Separated identicals ..... ${}_{s}D={}_{s}E+{}_{s}N$
Unseparated identicals ..... ${}_{i}D={}_{i}E+{}_{i}N$
Fraternal twins ..... ${}_{f}D={}_{f}E+{}_{f}N+G$

We thus assume that any difference between a pair of identical twins is a function of E and N, and that the difference for fraternals is a function of these factors and a genetic factor also. Assuming further that ${}_{s}N={}_{i}N$, we have the relation ${}_{s}\overline{D}-{}_{i}\overline{D}={}_{s}\overline{E}-{}_{i}\overline{E}$ where the overbar indicates mean value and the subscripts refer to groups. A few such differences are presented in Table II.

From the values in this table it will be noted that the differences between means of groups are significant for weight (5.87 ± 1.22), possibly for I. Q. ($2.86\pm.95$) and almost surely for scholastic achievement (9.88 ± 1.91). These findings substantiate those from the correlations above.

It thus appears that, owing to the excess of environmental differences in separated as compared with unseparated twins, environment can effect weight, intelligence and scholastic ability to a significant extent. No differentiation as to type of environment is here made.

TABLE II

MEAN DIFFERENCES FOR SEPARATED AND UNSEPARATED IDENTICAL TWIN PAIRS

Character	Twins reared apart, ${}_c\bar{D}$	Twins reared together ${}_i\bar{D}$	Differences ${}_c\bar{D}-{}_i\bar{D}$	Difference PE
Height (in.)	1.80	1.61 ± .15	0.19 ± 0.31	0.6
Weight (lbs.)	9.90	4.03 ± .36	5.87 ± 1.22	4.8
Head length (min.)	2.20	2.59 ± .21	−.059 ± 0.42	0.9
Binet I. Q.	8.21	5.35 ± .41	2.86 ± 0.95	3.0
Stanford	16.26	6.38 ± .57	9.88 ± 1.91	5.2
Woodworth	5.00	5.48 ± .47	−.048 ± 0.93	0.5

We shall next analyze these same data by the method of variance. The advantage of this method lies in the fact that the various factors contributing to the total variance may be treated additively, if uncorrelated, as will be assumed here.

Under assumptions similar to those made above we may write the various equations for the three groups:

Unseparated identicals ..... ${}_s\sigma_d^2 = {}_s\sigma_e^2 + {}_s\sigma_n^2$

Separated identicals ..... ${}_i\sigma_d^2 = {}_i\sigma_e^2 + {}_i\sigma_n^2$

Fraternal twins ..... ${}_f\sigma_d^2 = {}_f\sigma_e^2 + {}_f\sigma_n^2 + \sigma_g^2$

the front subscripts referring to the respective factors.

We shall further assume that ${}_s\sigma_n^2 = {}_i\sigma_n^2$ and that ${}_i\sigma_e^2 + {}_i\sigma_n^2 = {}_f\sigma_e^2 + {}_f\sigma_n^2$. The difference ${}_s\sigma_d^2 - {}_i\sigma_d^2 = {}_s\sigma_e^2 - {}_i\sigma_e^2$ thus represents the part of the twin difference variance attributable to difference in environment of separated and unseparated identical twins, and the quotient $({}_s\sigma_d^2 - {}_i\sigma_d^2) / {}_s\sigma_d^2 = v^2$ represents the fraction of the total separated twin variance attributable to such causes. Likewise the ratio ${}_i\sigma_d^2/{}_f\sigma_d^2$ indicates the proportion of fractional twin variance attributable to E and N. It also follows that $({}_f\sigma_d^2 - {}_i\sigma_d^2) \Big/ {}_f\sigma_d^2 = \dfrac{{}_f\sigma_g^2}{{}_f\sigma_d^2}$ represents the proportion of fraternal twin variance attributable to G. The latter ratio will be designated as h^2, and the former by $1-h^2$.

A number of these values are presented in Table III. It is apparent from the values of v^2 that 87 per cent of separated twin variances is variance is attributable to environmental differences between separated and unseparated twins in the case of weight. For Binet I. Q. the corresponding percentage is 59, and for school achievement it is 87. For these three characters, then, the major portion of the variance is attributable to causes produced by disparity in environment.

Turning to the values of $1-h^2$ we find the value of .21 for weight

TABLE III

VARIANCE OF TWIN DIFFERENCES AND CERTAIN RESERVED VALUES

Trait	${}_s\sigma_d^2$	${}_i\sigma_d^2$	${}_f\sigma_d^2$	v^2	$1-h^2$	h^2
Height	3.4225	2.6244	14.8225	.23	.18	.82
Weight	115.1329	14.5161	69.9561	.87	.21	.79
Head length	6.0516	4.9284	20.6116	.18	.24	.76
Binet	44.2225	18.0625	58.9824	.59	.31	.69
Stanford	227.2225	35.6409	100.0000	.87	.36	.64
Woodworth	23.8144	24.3049	28.5156	—	.85	.15

as compared with v^2=.87. The relative effectiveness of "nature" and "nurture" appears to be reversed for these two groups. In general it would appear that if the environment of a pair of twins differs greatly, the genetic factor plays a relatively small part and vice versa. The role of "nature" and nurture" thus are functions of the type of environment as well as trait.

These inferences are borne out by the Binet test and those of school achievement. For separated cases 59 per cent of variance is attributable to "nurture" differences, while for fraternals this percentage is only 31. In the case of school work the corresponding percentages are 87 and 36. The greater the variation in environment, the greater role this factor plays in producing changes in character.

Under assumptions similar to those already made we have

$$h^2 = \frac{{}_i r - {}_f r}{1 - {}_f r} = \frac{{}_f\sigma_g^2}{{}_f\sigma_d^2}$$

were ${}_i r$ and ${}_f r$ are the correlations between identical and fraternal twins respectively for a trait. It also follows that $1-h^2 = \frac{1-{}_i r}{1-{}_f r}$. The ratio of "nature" to "nurture" factors may be expressed by a value t^2 given by $t^2 = \frac{h^2}{1-h^2} = \frac{{}_i r - {}_f r}{1 - {}_i r}$. An abbreviated list of these values is given in Table IV.

From the values in the above table it appears that from 75 to 90 per cent of fraternal twin variance is attributable to "nature" for physical traits. In the case of intelligence the values of h^2 range from .65 to .80, so that on the average nearly three-fourths of the variance in intelligence is attributable to "nature." For the Stanford Achievement Tests, which are also intelligence tests in part, the value of h^2 from the total score is .64. In the case or arithmetic com-

TABLE IV

VALUES OF t^2 AND h^2 FROM CORRELATIONS CORRECTED FOR AGE (50 FRATERNAL TWIN PAIRS)*

Trait	rT	rr	t^2	h^2
Standing height	.932	.645	4.22±1.26	.81±.05
Weight	.917	.631	3.45±1.07	.78±.05
Head length	.910	.583	3.63±1.10	.78±.05
Finger ridges—right hand	.907	.337	6.13±1.58	.86±.03
Finger ridges—left hand	.924	.501	5.57±1.53	.85±.04
Finger ridges—both hands	.947	.459	9.21±2.37	.90±.02
Binet mental age	.861	.599	1.88±0.68	.65±.08
Binet I. Q.	.881	.631	2.10±0.74	.68±.08
Otis score	.901	.572	3.32±1.04	.77±.05
Otis I. Q.	.922	.618	3.90±1.17	.80±.05
Stanford tests: Word meaning	.859	.563	2.10±0.72	.68±.07
Stanford tests: Arithmetic computation	.726	.688	0.14±0.26	.12±.20
Stanford tests: Nature study	.771	.653	0.52±0.35	.34±.15
Stanford tests: History-literature	.820	.672	0.82±0.43	.45±.13
Stanford tests: Spelling	.874	.732	1.13±0.52	.53±.11
Stanford tests: Total	.892	.696	1.81±0.68	.64±.09
Woodworth-Mathews	.558	.365	0.44±0.28	.30±.14
Tapping speed—wrist	.592	.442	0.37±0.28	.27±.15
Tapping speed—finger	.664	.377	0.85±0.38	.46±.11
Tapping speed—total two hands	.688	.382	0.98±0.41	.50±.11

* The probable errors in this table are doubtful for extreme values of h^2. The distributions of t^2 and h^2 are being investigated at the suggestion of Dr. Snedecor.

putation the value of h^2 is only .12±.20 which is insignificant. This suggests that training accounts for nearly all the observed variance in computation skill. For spelling, however, h^2=.53 which indicates that "nature" and "nurture" have been about equally effective in producing variation in this trait. If these last two values approximate even roughly the true ratios of "nature" and "nurture" factors, the implication would appear to be that training plays a far more important role in producing good computers than in producing good spellers amongst twins.

In the case of number of finger ridges the value of h^2 is increased from .85 to .90 by the inclusive of both hands. This rise is similar to that found upon increasing the length of an ordinary test. We might at first expect this value to be almost unity because "nature" alone would appear the only factor involved. Some of the finger ridge disparity for a pair of twins, however, may well be ascribed to certain developmental factors possibly operating before birth and these have been included under our general "nurture" category $E+N$.

The effect of test reliability upon all of the above values has been separately studied, but space does not permit its inclusion here. The general effect is a rise in the value of h^2 when such corrections are made, but this increase is not usually large. We have also studied

the effect of the asymmetry mechanism upon the values of h^2. The estimated effect of this factor is .05 in terms of variance.

The term "nature" has been taken here to mean a genetic factor while "nurture" includes not only external environment, but prenatal development influences, asymmetry mechanism and miscellaneous factors. The division into "nature" and "nurture" where the latter is understood to be external environment is insufficient. We can study the role of "nature" factors to all the rest within the limitations of the assumptions made, but it is very difficult to obtain even a fair estimate of the effect of the environmental factor E.

In the case of separated twins we have shown that differences in external environment may have a very significant effect on producing twin differences for such traits as weight, intelligence, and school achievement. It has also been shown that role of nature and nurture depend greatly upon the type of environment.

The relation of "nature" to "nurture" factors is not only dependent upon actual disparity in twin environments, but it is a function of the kind of trait. "Nurture" influences have a relatively large effect in modifying such traits as arithmetical computation, nervous stability, speed of tapping, etc., and a relatively small effect on nearly all of the other physical and mental traits in the case of fraternal twins reared together. The role of "nature" in producing differences appears to be nearly as important for intelligence and school work as it does for physical character.

It thus appears that the old question of the relative importance of "nature" and "nurture" calls for a great deal more than allocation of weights for such factors. The "nurture" factor is complex and difficult to analyze into external environment, developmental environment, asymmetry influence, etc. The role of all such factors also appears to change with type of trait and kind of environment.

Some of the most significant findings of the present study would appear to be those with respect to intelligence. This trait is at least fairly well measured by our language and non-language tests. From the values of h^2 presented above it appears that the small differences in environment of twins reared together produce relatively small changes in such characters being of the maximum order of 27 per cent in variance. When we study twins with widely different environments, however, the difference in intelligence of twin pairs is undeniable. The effect of environment upon intelligence is further substantiated by the correlations of separated twin differences and environmental ratings. Extreme differences in educational and social environment then do produce significant changes in intelligence.

A STUDY OF ADOPTED CHILDREN AS A METHOD OF INVESTIGATING NATURE-NURTURE

By Alice M. Leahy

In June, 1934, the Institute of Child Welfare at the University of Minnesota completed a research project entitled "Nature-Nurture and Intelligence" in which adopted children were used as experimental subjects. The study was prompted by the discrepancies between the results obtained by Burks of Stanford and Freeman of Chicago in their notable investigations published in 1928. Briefly, Burks found consistently low correlations between the intelligence of adopted children and various attributes measured in their foster homes. On the other hand, Freeman found a resemblance which is as high as that expected for true parents and offspring where both nature and nurture are operative. The most frequently offered and best supported explanation of this discrepancy is to be found in what is called *selective placement, i.e.,* fitting the child, from the standpoint of intellectual promise, to the home. Resemblance between intelligence of adopted children and their homes may be a function of either selective placement or environment, or of selective placement and environment combined in unknown proportions.

The Minnesota study was limited to children placed in their foster homes at the age of 6 months or younger. At this early age precise judgments of mental ability on the basis of test performance, physical development or overt behavior are highly improbable. Further, this criterion assures from early infancy an environment that is no more or less changing in character than that enjoyed by children in general.

Our second criterion permitted the inclusion of only those adopted children who were definitely known to be of white race, non-Jewish, north-European extraction. This prerequisite tends to minimize the possibility of a spurious heterogeneity arising from uncontrolled factors relating to race.

Our third criterion demanded a fair sample of adoptive homes at each occupational level. Because of the limited number of children placed in homes of the laboring class only 24 children were available that satisfied our other criteria. At every other level 40 children were secured. With these numbers we have not only obtained a fair picture of environmental differences contingent on occupational status but have also secured a fair sample of the selective placement that

may operate on the basis of cultural status. A small number at any level might give a distinctly distorted picture.

By adhering rigidly to the three foregoing criteria it is believed that we have controlled the element of selective placement to a point beyond the facilities of earlier investigators and to the highest possible degree that present day child adoption permits. Fitting the child to the home on the basis of coloring, physique and religious faith, all of which occur, could hardly give rise to an adventitious mental resemblance. Selective placement upon the basis of cultural status, however, is still possible.

Our fourth criterion limited the group of children who were 5 to 14 years of age at the time of investigation. This age range is conceded to give the most reliable test results.

The fifth and final criterion demanded the inclusion of only those children who had been reared in communities of 1000 or more. In this way we attempted to equalize the influence of such environmental factors as churches, clubs and schools. No farm children are included. Ninety-five per cent of our group have been reared in communities of over 10,000.

In addition to circumscribing our experimental population, a control group of parents and true offspring was secured. The same requirements for race were held for this group as for the adoptive parent and child. In selecting control children, each adopted child was matched for sex and within an age agreement of plus or minus 6 months. Parental occupation and education in each case were rigidly controlled. An acceptable match demanded that both fathers fall in the same group on the Minnesota occupational scale, and that the education of each parent (*i.e.*, adoptive father—control father, adoptive mother—control mother) match within a range of plus or minus one school grade level. In matching cases for occupation and education we employed the two most objective indices of cultural status that are available. Consequently, it would seem that the trend of any general trait concerning the children and their environment would be similar in direction and magnitude for both the adopted and control populations if environment is dominant.

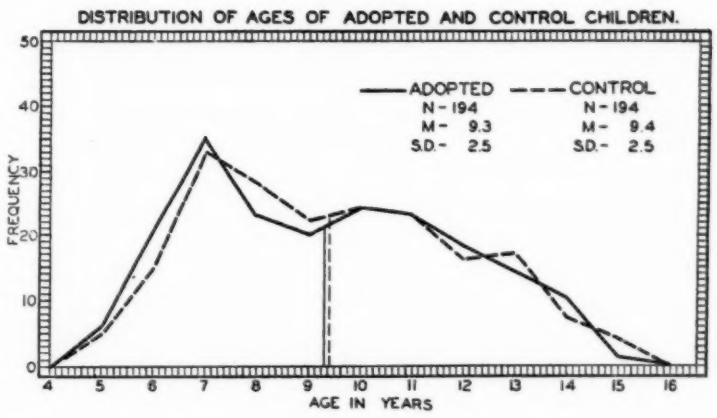
The control group serves as a check upon our methods. Whatever unreliability exists because of imperfections in our measuring instruments will be similarly existent in the control population. Further, whatever the accumulated effect of environment may be, it will be operative in both populations in the same direction since both have enjoyed what might be termed as an ordinarily continuous environment.

The degree to which we have been successful in locating two groups of children living under similar environmental conditions, one, unrelated by blood to the adults rearing them, the other, the offspring of the adults formulating the environment, will be shown by a series of graphs.

First, however, attention should be called to the source and number of our research populations. Our subjects were chosen on the basis of the criteria previously described from a census compiled by the Institute of Child Welfare and the State Board of Control of 2875 children adopted in a ten-year period in Minnesota. Ninety per cent of the adoptive parents requested to participate cooperated. A total of 194 children and one or both of their adoptive parents constitute the experimental group. A similar number of parents and their true offspring taken from the Minneapolis and St. Paul Schools compose the control population. In each group, there are 75 boys and 119 girls.

The first criterion on which our adopted children and control children were matched is age. Chart I shows how nearly alike our children are in age. The mean for the Adopteds is 9.3 years, for the Controls, 9.4 years. A variability in age of 2.5 years exists in both populations.

CHART I



Since we are interested in the intellectual variance in these two groups of children and since school attainment is in part a function of intellectual ability, the children could not be matched for school grade. School grade was allowed to vary accordingly as the factors affecting it vary. However, since school progress is influenced by age

as well as by ability we should expect our adopted and control children to be similarly distributed from the standpoint of amount of schooling. The agreement in school attainment as presented in Chart II is striking. The mean school grade of the Adopteds is 3.9 with a standard deviation of 2.5; the mean for the Controls is also 3.9 with a standard deviation of 2.5. Hence, whatever may be the influence of environment functioning through the institution of the school, we should expect it to affect the two groups equally.

CHART II

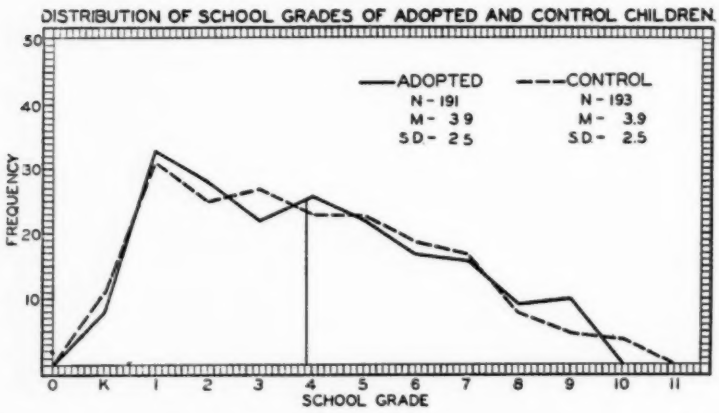
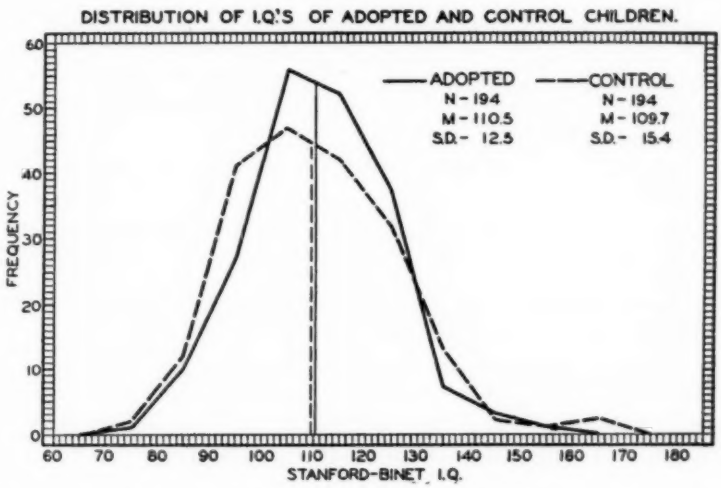


Chart III describes the distribution of intelligence test scores of the children. The average I.Q. of the Adopted children, as determined by the Stanford Binet Test is 110.5, of the Controls 109.7. A statistically insignificant difference of .8 exists between the two groups. Although practical identity exists in test intelligence, the averages of the two groups are above the average of children in the general population. This difference could not be attributed to the disproportionately larger number of girls in these data, 61 per cent as against 39 per cent boys, since a separate analysis of the test performance of the boys and girls in both populations showed the difference between the sexes to be insignificant. The mean I.Q. of adopted boys is 109.6, of adopted girls—111.4. The ratio of the difference to its standard error is 1.02. In case of the control children, the mean for boys is 110.0, and for the girls, 109.5. Here the ratio of the difference to its standard error is .004.

The difference may be explained by selection. The probability that it is operative in the Control population is reasonable since in matching homes on the basis of adoptive fathers' occupation the number

of homes in the upper economic levels outweighs the number of homes in the lower occupational groups.

CHART III



What is the evidence of selection in the adopted group? If we have random placement of adopted children, an excess of homes from the upper economic levels should not have the effect observed, unless it can be ascribed to the influence of environment. Before such a conclusion is warranted, the elimination of unpromising candidates for adoption must be considered. Inquiry into the laws concerning the adoption of children in Minnesota, which are not essentially different from those in most states, reveals that a child is regarded as unsuitable for adoption if one of more of the following obtain: (1) the offspring of incestuous cohabitation, (2) one or both parents feebleminded or insane and the mental state of the child is as yet undetermined, (3) if the child is crippled or deformed or afflicted with tuberculosis, venereal disease, or other contagious or offensive diseases that renders his presence a menace to others. Further, the law explicitly states "no petition to adopt a child shall be granted until the child has lived in the proposed home for six months unless the court has been shown good cause and been satisfied that the proposed home and child are uited to each other." On the basis of these conditions, we should expect positive skewness in the intelligence level of any group of Minnesota adopted children.

There is an important difference in variability in I.Q. between the two groups. The standard deviation in I.Q. for the Control children

is 15.4, for the Adopted, it is 12.5. The ratio of the difference in variability to its standard error is 2.9. This greater variability in the Controls should be considered in relation to the environment of each group. If variability in I.Q. is a function of variability in environment, then we should expect greater variability in the adopted group, since the environment of the Adopted group is somewhat more variable than the environment of the Controls.

The general environments of our populations are very similar. The occupational status of the fathers of the Adopted and Control children are identical. The mean school grade of the fathers of Adopted children is 11.2, of Controls, 11.4. The standard deviation for the fathers of Adopted children is slightly greater—4.3 as against 4.0 for the Controls. The agreement is very close for education of the mothers. A mean grade level of 10.5 is the attainment of the mothers of Adopted children and 10.8 for the Control mothers. The variability in both groups is about the same; 3.1 and 3.0 respectively. The distribution of the mid-parent score on the Otis Test of Mental Ability is similar. The difference in the two sets of parents is only slight. The average for the parents of Adopted children is 50.0, for the Control parents, 52.0. Greater variability exists in the Adopteds,—13.6 as against 13.1 for the Controls. The differences in the performance of the two groups of parents on the Stanford-Binet Vocabulary Test is insignificant. The Adoptive parents earned an average score of 65.9, the average for the Controls is 63.2.

It appears from the foregoing evidence, that in general, the environmental conditions in the Control group are truly comparable to those in the Adopted group. Hence, if environment is dominant, we should expect that the relationship of child intelligence to any one of these indices, or to any combination of them, to be relatively the same for both sets of children. In the tables to follow, the relationship of the child's I.Q. with the various attributes of the home environment will be presented. These relationships are expressed in uncorrected product moment correlations.

Table I shows that the difference between corresponding correlation coefficients in the Adopted and Control groups is striking. In both sets of data, the correlations are consistent, running about .18 for Adopted children and .51 for Control children. The expected familial resemblance is demonstrated in the Controls—reflecting the combined effects of heredity and environment. The correlations for the Adopteds, on the other hand, indicate the effect of environment alone, providing selective placement is entirely absent.

A comparison of our findings with those of Freeman and Burks

is shown in Table II. It is interesting to note that the Burks and

TABLE I

CHILD'S I. Q. CORRELATED WITH OTHER FACTORS

Factor	*Adopted Children*			*Control Children*		
	r	P. E.	N	r	P. E.	N
Father's Otis Score	.15	.05	178	.51	.04	175
Mother's Otis Score	.20	.05	186	.51	.04	191
Mid-parent Otis Score	.18	.05	177	.60	.03	173
Father's S. B. Vocabulary	.22	.05	177	.47	.04	168
Mother's S. B. Vocabulary	.20	.05	185	.49	.04	190
Mid-parent S. B. Vocabulary	.24	.05	174	.56	.03	164
Environmental Status Score	.19	.05	194	.53	.03	194
Cultural Index of Home	.21	.05	194	.51	.04	194
Father's Education	.16	.05	193	.48	.04	193
Mother's Education	.21	.05	192	.50	.04	194
Mid-parent Education	.20	.05	193	.54	.03	194
Father's Occupational Status	.12	.05	194	.45	.04	194

Leahy data are in marked agreement. Freeman, on the contrary, found consistently higher correlations for every characteristic considered.

TABLE II

ADOPTED CHILD'S I. Q. CORRELATED WITH OTHER FACTORS

Factor	*Freeman*			*Burks*			*Leahy*		
	r	P. E.	N	r	P. E.	N	r	P. E.	N
Father's Intelligence	.37	.04	180	.07	.05	178	.15	.05	178
Mother's Intelligence	.28	.04	255	.19	.05	204	.20	.05	186
Mid-parent Intelligence	.39	.04	169	.20	.05	174	.18	.05	177
Father's Vocabulary	.27	.05	152	.13	.05	181	.22	.05	177
Mother's Vocabulary	.37	.04	224	.23	.04	202	.20	.05	185
Mid-parent Vocabulary	.36	.05	146	—	—	—	.24	.05	174
Home Rating	.48	.03	401	.21	.04	206	.19	.05	194
Cultural Index	—	—	—	.25	.05	186	.21	.05	194
Father's Education	—	—	—	.01	.05	173	.16	.05	193
Mother's Education	—	—	—	.17	.05	194	.21	.05	192
Mid-parent Education	.42	.03	?	—	—	—	.20	.05	193
Father's Occupation	.37	.03	394	—	—	—	.12	.05	194

Further analysis is needed to determine the amount of selective placement in our research population. However, the probability of its existence suggests that the average coefficient of correlation of .18 found between the I.Q. of the Adopted child and environment is largely or wholly the result of selective placement. If further analysis supports this hypothesis, then we must conclude that the influence of environment on measured intelligence is relatively insignificant.

HOUSING CONDITIONS IN AMERICA

By Nathanael H. Engle

The Real Property Inventory was planned by the Bureau of Foreign and Domestic Commerce in cooperation with other interested governmental and industrial groups and carried out this year with the aid of the Census Bureau as a Civil Works Administration project. A complete census of residential structures was taken in 64 cities so selected as to give a representative cross section of urban America. Every state in the Union was represented by one or more cities. Both small and large communities were included as well as a wide range of industrial diversification. The project also included a sample survey of significant financial items such as mortgage status and family income.

On the basis of the data thus collected from 2,633,135 dwelling units it is possible to draw a fairly clear picture of housing conditions as they exist in American cities today. An interesting approach is to reconstruct the typical or normal American home in the statistical sense of normal. This may be done for the country as a whole as revealed by the sample and for individual cities. Differences between owned and rented homes may also be observed on this basis.

The typical American home may be described as a single-family dwelling, about nineteen years old, of wood or frame construction containing five rooms. It is equipped with either bathtub or shower, indoor water closet, uses electricity for lighting and gas for cooking. For the country as a whole reliance is placed predominantly upon heating stoves for heat, although over 31 per cent of all dwelling units use warm air furnaces. Coal is the principal fuel used. This hypothetical or composite American home is deduced from the following facts. Nearly 80 per cent of all residential structures in the cities canvassed were single-family dwellings. Two-family dwellings accounted for 13 per cent of the total, while all others made up less than 8 per cent of all structures. If the survey had included more of the larger cities, these ratios might show a greater proportion of the total in multiple-family dwellings. However, even in Cleveland, Ohio, a city of more than a million inhabitants, 41.5 per cent were single-family houses. In the same city 28.8 per cent were two-family structures, while 29.7 per cent included apartments, row houses or terraces and other types of residential structure.

The age of the home is derived from the fact that nearly 26 per

cent of the structures were reported to have been built from ten to twenty years ago. Less than 7 per cent had been built within five years, while 26 per cent were built not more than ten years ago. Eighteen per cent were reported to be from twenty to thirty years of age, 22 per cent from thirty to fifty years, while 8 per cent were reported to be more than fifty years of age.

Eighty-three and a half per cent of all single family residential structures in the 64 American cities were of wood. Brick houses accounted for but 8.7 per cent of the total, stucco houses 6.5 per cent, and all other types including stone and cement blocks made up but 1.3 per cent of all single family structures. There is, of course, considerable variation from city to city, some sections of the country showing a much larger percentage of brick or stucco homes than others.

TABLE I

SINGLE-FAMILY DWELLING UNITS BY SIZE OF DWELLING AND TENURE
(64 Cities Combined, 1934)

Number of rooms	Owner-occupied units		Rental units	
	Number	Per cent of total	Number	Per cent of total
1	3,013	.35	6,725	1.00
2	11,390	1.32	28,448	4.21
3	35,725	4.15	87,927	13.00
4	93,847	10.91	127,238	18.81
5	218,390	25.38	180,139	26.63
6	222,912	25.91	132,594	19.60
7 or more	275,188	31.98	113,270	16.75
Total	860,465	100.00	676,341	100.00

There are a number of interesting distinctions which come to light when rented and owner-occupied units are compared. Nearly 40 per cent of the residential units covered in this study were owner-occupied homes. The typical owner-occupied home was considerably larger than the average rented home. Over 83 per cent of all single-family homes which were occupied by their owners had five or more rooms, as contrasted with 63 per cent of rented single-family homes.

Interesting and important differences are found in the mechanical equipment and sanitary facilities of owner-occupied homes and rented dwellings. For example, nearly 21 per cent of the owner-occupied homes were equipped with mechanical refrigeration in contrast with little more than 14 per cent of the rented homes. Only in the Pacific Coast cities was this relative position reversed with nearly 22 per cent of rented homes having mechanical refrigeration, while only 18 per cent of owner-occupied homes were so equipped. In the New

England cities included in the survey and in those located in the South Atlantic and East South Central sections of the country the ratios for owner-occupied homes having mechanical refrigeration were over twice the corresponding percentages for rented homes. Only one city reported less than 10 per cent of the owner-occupied homes to have mechanical refrigeration, whereas twenty-three cities showed less than 10 per cent of the rented dwelling units to have such equipment.

The use of electricity and gas for lighting and cooking brings out similar interesting distinctions. Ninety-five per cent of all owner-occupied homes used electricity for lighting in contrast with 87 per cent of the rented homes. Gas was used for cooking by 73 per cent of the owner-occupied homes and 67 per cent of the rented homes.

The absence of sanitary plumbing on a larger scale than is commonly realized is one of the outstanding facts revealed by this study. Sixteen per cent of owner-occupied homes had neither bathtub nor shower. This ratio varied from a maximum of nearly 35 per cent in the East South Central states to a minimum of less than 9 per cent on the Pacific Coast. The figures are much higher for rented homes. Nearly 28 per cent on the average reported absence of bathtubs and showers, while the range was from 14 to 58 per cent without such facilities. Similar variations are found for indoor water closets. In two sections of the country over a third of the rented homes in the cities studied had no such facilities, while in three sections over one-fifth of the owner-occupied homes were without this important sanitary accessory. These are most amazing data, in view of the fact that only cities were included in the survey. Extreme variation in all of these items are shown in the individual city reports.

TABLE II

VALUE OF SINGLE-FAMILY OWNER-OCCUPIED HOMES AS REPORTED BY OWNERS

(64 Cities Combined, 1934)

Value	Number of homes	Per cent of total
Under $1,000	68,894	8.01
$ 1,000-$ 1,499	61,651	7.16
$ 1,500-$ 1,999	72,313	8.40
$ 2,000-$ 2,999	154,730	17.98
$ 3,000-$ 4,999	250,515	29.11
$ 5,000-$ 7,499	146,921	17.07
$ 7,500-$ 9,999	46,169	5.37
$10,000-$14,999	31,144	3.62
$15,000-$19,999	11,405	1.33
$20,000 and over	12,550	1.46
Not reported	4,173	.49
Total	860,465	100.00

One of the more significant economic aspects of American housing is the value and mortgage status of owner-occupied homes. We have collected and carefully edited reports from the owners of 860,465 single family homes as to their estimates of the value of their property at the time the survey was taken early this year. The frequency distribution of the reports in Table II indicates a relatively symmetrical curve slightly skewed toward the lower values. For the entire group of 860,465 single family homes in the sixty-four cities covered, 54 per cent were mortgaged. The ratio varied from city to city, the range being from 16 per cent in Frederick, Maryland, to 76 per cent in Waterbury, Connecticut.

TABLE III

GROSS MONTHLY RENTAL RATES, ALL RENTAL UNITS

(64 Cities Combined, 1934)

Gross monthly rental	Total All rental units		Single family dwelling units		All other dwelling units (Multiple family)	
	Number	Per cent of total	Number	Per cent of total	Number	Per cent of total
Under —$10.00	248,650	15.57	138,290	20.45	110,360	11.98
$ 10.00—$14.99	292,202	18.29	137,247	20.29	154,955	16.83
$ 15.00—$19.99	284,173	17.79	112,517	16.64	171,656	18.64
$ 20.00—$29.99	413,522	25.89	151,443	22.39	262,079	28.46
$ 30.00—$49.99	272,104	17.04	96,703	14.30	175,401	19.05
$ 50.00—$74.99	49,725	3.11	19,587	2.90	30,138	3.27
$ 75.00—$99.99	8,111	.51	3,721	.55	4,390	.48
$100.00 and over	4,709	.30	2,601	.38	2,108	.23
Not reported and rent free	24,012	1.50	14,232	2.10	9,780	1.06
Total	1,597,208	100.00	676,341	100.00	920,867	100.00

Closely related to the value aspect of owner-occupied homes is the rental rate for rented property. Over a million and a half rented dwelling units were covered by the survey. Table III presents a frequency distribution of these reports by the gross monthly rental rate. A very marked skewness towards the lower rental rates is revealed by the fact that nearly 52 per cent of the total reported rates of less than $20 per month. When the data are broken down between single family and multiple family dwelling units it appears that owners of the latter, which include apartment houses, are able to secure higher average rates. Over 20 per cent of the single-family units rent for less than $10 per month as compared with less than 12 per cent of the multiple-family units.

Sectional differences in average rental rates are of interest as indicative of variation in housing standards. In the New England and Middle Atlantic cities the concentration was definitely in the $20 to

$30 class. For East North Central cities there was a considerable spread between the various rental groups. In most of the southern and western cities low rental rates predominated, while high rental rates prevailed in but two of the 64 cities, Fargo, North Dakota and Reno, Nevada.

It was realized in the collection of these rental data that gross monthly rental figures are somewhat misleading, due to variations in the extent to which the quoted rental rates include concessions of different kinds. To provide some basis for making proper allowances for these items information was collected on the extent to which certain concessions were included with the dwelling unit in the gross rental rate. Out of more than 1,500,000 cases, 42 per cent reported no concessions of any sort. Apart from garages which are often an integral part of the house or built on the same lot and therefore normally included with the house, it appears that concessions affect but a small percentage of the rented properties.

One of the most important questions which the Real Property Inventory may be expected to answer is, how adequately are the American people housed? No precise answer can be given to this question until a complete census of American housing is taken. It is possible, however, to use the Real Property Inventory data as a basis for estimates for the country as a whole. Since the sample is at once large and carefully selected, such estimates should approximate the truth fairly closely.

TABLE IV

CONDITION OF OCCUPIED DWELLING UNITS

(64 Cities Combined, 1934)

Condition	All dwelling units		Single-family units	
	Number	Per cent of total	Number	Per cent of total
Occupied units				
Good condition	946,553	38.97	579,533	39.93
Need minor repairs	1,081,385	44.52	633,055	43.62
Need major repairs	357,005	14.70	213,586	14.72
Unfit for use	41,891	1.72	23,928	1.65
Not reported	2,073	.09	1,137	.08
Total, occupied units	2,428,907	100.00	1,451,239	100.00
Vacant units				
Good condition	51,558	25.25	20,127	23.52
Need minor repairs	86,565	42.39	33,771	39.47
Need major repairs	48,842	23.91	21,684	25.34
Unfit for use	16,856	8.25	9,723	11.36
Not reported	407	.20	262	.31
Total, vacant units	204,228	100.00	85,567	100.00

There would seem to be a good basis for estimating the probable potential demand for new housing and for repairs and modernization. An examination of some of the supply and demand factors will illustrate. A total of 2,633,135 dwelling units were included in the survey in 64 cities, which in 1930 had a combined population of 9,793,371 persons. Of these dwelling units 204,228 or 7.8 per cent of the total were vacant. These figures of themselves would seem to indicate surplus housing facilities in the cities studied in so far as the supply side is concerned. Such a conclusion would be quite misleading, however, since there are other aspects of the supply which need to be examined.

Reports were secured on the physical condition of all properties canvassed. Of all dwelling units 58,747 were reported in such bad condition as to be unsuitable for use as dwelling houses and yet 41,891 of these places were actually occupied. Data on the duration of vacancies indicates that 30,600 of the vacant dwelling units had been vacant for two years or more and 26,159 additional units for from one to two years. It is reasonable to assume that most of these properties are deteriorating and are probably in need of major repairs if they are not already beyond profitable repair.

On the demand side of the picture two sets of data need to be examined: the density of population as measured by the number of persons per room in occupied dwelling units, and the data on "extra" families. There were 414,837 dwelling units or 17 per cent of the total which were crowded to the extent that there was an average of more than one person per room. These data indicate a *social* need for more housing and for more than is available when due allowance is made for habitable vacancies. However, they tell us but little of the *economic* demand for new houses. To gain a better idea of the potential economic demand we framed a question on extra families in such a way as to bring out what we needed to estimate the potential demand for new housing. The answers to this question reveal a total of 183,200 extra families or 7 per cent of all families included in the survey. These extra families were about evenly divided between owner-occupied and rented homes. There was considerable variation, however, from one section of the country to the other, a variation which would have to be taken into consideration in estimating potential demand conditions for the country at large.

Without going into greater details, I believe I have indicated the basis from both the supply and demand side upon which an estimate may be made of the housing needs for the country as a whole. Other data, such as the Census Bureau has collected on population and

families, must also be used in arriving at a sound estimate. Taking all of these facts into consideration, it has been estimated on a preliminary basis that there is a potential economic demand for 1,500,000 new dwelling units in urban United States. The adequacy of American housing also involves a consideration of such factors as plumbing, heating, and lighting facilities. I have already called your attention to deficiencies in these items. Whether we like it or not the facts clearly indicate widespread sub-standard living conditions throughout American cities. Communities of all sizes share the doubtful honor of permitting large segments of the population to exist in the meanest sort of living quarters, many of which are highly unsanitary and therefore a distinct menace to the health of our people.

THE FINANCIAL SURVEY FOR URBAN HOUSING

By David L. Wickens

As consideration of the housing problem in the United States emerges from the speculation stage and develops into active programs, it has become increasingly necessary to define the problem and the elements that compose it. More than a year ago a number of people concluded that a more active construction industry must be a part of economic recovery, that housing must hold an important place in the improvement of construction, and that there was need for more scientific information concerning the entire problem. The data available in the field of urban housing had long been recognized as far deficient in comparison with data for other classes of property. There was particularly a need for information on value, rent, occupancy, density of use, indebtedness, financing terms, family incomes, and other items essential for describing and dealing with the finances and economics of the question.

The Civil Works Administration provided the opportunity of filling in this conspicuous gap in our knowledge of real property. A project was authorized providing for the employment of "white collar workers" in making an intensive survey of the economics and financial phases of residential property. The project, originally placed under the auspices of the Department of Commerce, was later transferred to the control of a committee representing several Government agencies.

The inquiry was made in one or more cities in every state, totaling sixty-four cities. It was given detail and depth without the sacrifice of scope, by using a carefully stratified sample which averaged 15 per cent of the families. About 1800 enumerators working under supervision of the Bureau of the Census collected the data during an average period of employment of eleven days per person. Nearly half of the schedules were obtained by personal interview of families in designated territory. About an equal number of the schedules were filled out and mailed in by the families living in adjoining blocks. Mail inquiries were sent to owner landlords. The enumerated schedules were obtained at the rate of 8.2 schedules for each of the six-hour days worked. Refusals constituted only one per cent of the total number of families visited. From the results of this work came nearly a half million schedules, one-third of a million being actually tabulated and analyzed.

The schedule provided owner's reports on physical data descriptive of the property, the date of its construction, the purchase price and terms of the consideration, and for the years 1930, 1933 and 1934 the owner's estimate of value, data on the volume of indebtedness, the source of mortgage loans, the rate of interest and other terms of such credit and delinquency of mortgages. Each family reported the family income for 1929, 1932 and 1933, as well as wages and the per cent of full time employed. Tenants reported rents paid in 1929, 1932, and 1933, and the facilities included in rent, as well as information on the delinquency status of rents.

By thus relating the significant social and economic data with the physical property and the occupying family, the survey sought to accomplish the broad purpose of providing the basis for an appraisal of the entire economic position of the household. The project was designed to avoid the limitations which would result from an inquiry of too narrow a scope, and attempted to deal with all the factors which bear upon the whole problem of houses and the conditions under which various classes of families had tenure of different classes of shelter accommodations.

From the standpoint of methodology, the survey demonstrated that the necessary data for a comprehensive view of the housing situation in a community or in an area can be obtained through appropriate inquiries addressed to the intelligence of the public, provided the public is given assurance that its confidence will not be abused. It has been made clear that inquiries concerning physical property may also obtain such related economic and financial information as will permit families and communities to deal intelligently and effectively with their housing problems.

Among the useful results of the inquiry may be cited the classification of property by year built, which, taken in the aggregate, presents a history of the city's residential construction by types as well as the proportions of property of various ages, its present aggregate value, and the average value of such property by age. The purchase price of properties classified by year bought indicates the changes in prices paid for property since 1890. The means of acquiring property, the terms and form of consideration are also shown by years and periods over a similar length of time. The data thus provide a perspective of the city's property growth and value changes that is valuable in planning and judging the long term developments associated with real property.

The data on average rents as well as arrays of rents by rent groups, show that the average rent charged in 61 cities in 1933 was $252

per year, or $21 per month, the rent per room per month averaging $4.80 and varying from $3.30 for four East South Central cities to $5.50 for seven East North Central cities. However, 27 per cent of tenants were delinquent in their rent on January 1, 1934, hence,

TABLE I

AVERAGE RENT BILLS OF TENANT FAMILIES IN 61 CITIES BY GEOGRAPHIC DIVISIONS [1]

Areas	Number of cities	Per dwelling unit				Per room per month, 1933
		Per year, 1929	Per year, 1932	Per year, 1933	Per month, 1933	
All cities	61	$329	$284	$252	$21	$4.80
New England	6	340	293	298	25	5.10
Middle Atlantic	5	351	314	274	23	4.30
East North Central	7	418	347	295	25	5.50
South Atlantic	10	258	236	217	18	4.50
West North Central	10	351	311	277	23	4.40
East South Central	4	239	190	159	13	3.30
West South Central	7	321	273	236	20	4.70
Mountain	8	324	285	252	21	5.30
Pacific	4	344	354	257	21	5.20

[1] Aggregate of reports used; samples unweighted for cities.

the amounts actually paid were less than the rates quoted. A classification of rents by size of rent groups indicates the distribution range and general level of the demand for rented houses in respective cities. Other data showing the frequency and amount of rent delinquency for each rent group, offer further refinements for measuring the effective demand for housing accommodations. Efforts to assure the public of low cost housing will be aided by such information on the costs of various classes of existing dwelling units.

The survey has also provided a measure of the difference between rent representing the cost of room space and the cost of facilities and services included in the rent bill. The cost for such items as furnishings, electricity, mechanical refrigeration, heat, light, and garage may equal the cost of providing the room space which these facilities supplement. If such services are included in the rent, the resulting figures may be misleading when comparing the cost of different dwelling units. This inquiry has provided data on the frequency and the costs of services and facilities included in rent bills. It is essential that the rent service be thus defined when establishing criteria of housing costs and comparing housing costs for different types of structures, for dwelling units in large and small population centers and in different parts of the country.

Against the items of rent and value, representing the cost of hous-

ing, appears the family income from which the housing costs are paid. Family incomes shown as averages for each of the years 1929, 1932, and 1933, for owners and tenants separately, indicate the change in the total means at the family's disposal from a year of prosperity to a year of depression. The average income of 156,000 tenant families in 61 cities was $1,062 in 1933. When these family incomes are arrayed by size groups they disclose the range and limitations of total and average purchasing power. For example the largest number of all incomes appear in the $1,000–$1,500 group.

TABLE II

AVERAGE INCOMES, RENT DELINQUENCY AND EMPLOYMENT OF HEAD OF FAMILY, TENANT FAMILIES IN 61 CITIES, BY GEOGRAPHIC DIVISIONS[1]

Areas	Number of cities	Average family income, 1933	Per cent of income from wages and salaries	Ratio of rent bill to income, 1933 per cent	Per cent of families with rent not paid Jan. 1, 1934	Per cent of full time employment, family head
All cities	61	$1062	92.0	23.7	27.0	65
New England	6	1194	91.0	25.0	24.0	66
Middle Atlantic	5	984	98.4	27.8	33.0	63
East North Central	7	1099	93.2	26.8	28.7	61
South Atlantic	10	949	91.3	22.7	29.7	69
West North Central	10	1143	92.5	24.2	28.4	69
East South Central	4	779	90.0	20.4	38.1	59
West South Central	7	1095	92.4	21.6	22.6	72
Mountain	8	1081	88.7	23.3	24.0	62
Pacific	4	1120	88.4	22.9	17.0	66

[1] Aggregate of reports used; samples unweighted for cities.

For the consideration of housing questions probably the most significant use of income data is in showing their relation to rents and values. The average rent charge in 1933 was 23.7 per cent of the total income of the same families, though the proportion varied from 20.4 per cent for southeastern cities to 27.8 per cent for northeastern cities. If allowance is made for the 27 per cent of tenant families who reported that they were delinquent in their rent payments, it is probable that the proportion of these incomes that was actually expended as rent did not average much more than 20 per cent.

These results suggest that there are practicable limits to the amount chargeable for rents. The classification of families on the basis of the ratio of rent to income shows that delinquency in payments increased markedly as the rent-income ratio rose above 20 per cent. Of families with rent-income ratios between 15 and 20 per cent, about 16 per cent were delinquent, whereas those with ratios of 35 to 40 per cent were delinquent in 34 per cent of the cases.

All the economic considerations are reflected in the problem of

financing and are shown in the survey's financial data. The difficulties in financing, however, are increased by the variability of conditions and procedure which have accompanied a comparatively unstandardized market and which have resulted in important differences in cost, credit source, and procedure even between neighboring cities. The financial data are presented by year loan was contracted, interest rates, term, ratio of debt to value, tenure of borrower, type of structure, priority of obligation, and by source of credit. The loans reported indicate that approximately one-sixth of the total are held by each of the three classes of agencies: banks, insurance companies, and building and loan associations; while about one-fourth were held by individuals.

Despite a predominance of gradual payment loans, an average of from 35 to 40 per cent of property owners reported that their mortgages were delinquent on January 1, 1934. The difficulties apply to first mortgages as well as to junior liens, and extend to practically all classes of lending agencies. This is evidence that the past financing of the country's housing activities has left much to be desired and that fundamental problems remain to be solved. Particularly the calculation of the borrower's debt paying capacity under changing economic conditions appears to have been neglected.

The survey reveals a striking dependence upon incomes, and in turn upon employment and wages. Wages and salaries constituted 92 per cent of the average annual family income of all tenants reporting. The head of the average tenant family was employed 65 per cent of full working time in 1933, the proportion varying from 59 per cent in the cities of the East South Central States to 72 per cent of full time in the cities of the West South Central States. The size of the average family income was found to vary directly with the percentage of time worked. Thus the chain of factors affecting the housing conditions and the actual flow of funds for housing purposes traces back directly for tenants from rents to incomes to wages to employment, and for owners from values and debt payments to incomes, wages, and employment. It follows that efforts to improve housing conditions and to encourage the movement of capital into the housing field must give recognition to these fundamental relationships.

The building and financing of housing structures is essentially a long-term enterprise. The length of life of the average house, even when made of wood, involves the projection of an enterprise whose consequences are registered over one or more generations. The construction of houses for a nation involves large amounts of capital

and commits investments for a long period of time. The housing question is therefore one of the parts of the country's economic life which calls for attention to long-term considerations.

Viewed currently, the cost of shelter typically requires a substantial proportion of income, often to the extent of affecting other parts of the income stream. These expenditures for shelter are for residential property, the preponderant part of which typically consists of a structure which is a consumption good, subject to declining value, rather than equipment used in production to increase income and capital. This situation, with potentialities both for greatly expanded general welfare, and for huge commitments and economic maladjustments, holds possibilities of sufficient significance to indicate that a country can ill afford to miscalculate on basic plans. The housing problem has only recently received recognition as one deserving of major national interest. We are likely to be aided by careful definition of the problem and by continued examination of the elements which compose it. Numerous inquiries have already been initiated or proposed throughout the country. The time required to make an adequate inquiry as well as the nature and volume of capital investment which may be dependent upon its results, suggests the desirability that it should be made with both local and national considerations in view in order to provide maximum aid in the future planning of the communities and in any comprehensive national program that may be undertaken. A financal survey for urban housing can provide valuable aid for communities desiring to take an active part in the direction of their own future. Cities and towns, both large and small, may better consider this fact now rather than five or ten years hence after city plans have been entered upon, communities and buildings have been located and constructed, and a volume of long-term indebtedness has been incurred.

REAL ESTATE VALUES, HOUSING COSTS AND THE VOLUME OF CONSTRUCTION

By Roy Wenzlick

In our opinion, the relationship of the cost of building a new building, to the price at which a somewhat comparable existing building can be bought, is of fundamental importance. If the cost of new construction is greater than the price at which similar properties are being sold, there will be little new construction. Conversely, when a building shortage skyrockets rentals and values by a percentage large enough to bring values of existing building to a point where it seems that new buildings can be built for no more than the price at which comparable ones can be bought, a building boom will start of its own volition. We believe that a building boom can be started in no other way.

If this be true, and we would forecast the volume of new building, we must close our ears to high pressure campaigns and must study building costs and prices at which properties can be bought.

Building costs are comprised of three general types:

(1) Material
(2) Labor
(3) Overhead

Building material costs are about 15 per cent below the peak of the last boom, and more than 20 per cent above the lows of a year and a half ago. The labor cost of building a building has already increased some, due to code provisions, and will advance materially further if skilled labor avails itself of the provisions in the codes for setting skilled rates in given areas.

It is true that there has been a slight drop in material costs in the past few months, but we do not believe that costs can be pushed materially lower; in fact, we think that material costs are almost certain to go higher during the next few years.

The financing cost of building a building, if built with an insured loan, will be lower than the cost under a first and second mortgage. This, however, will be partially offset by the necessity of monthly amortization on these loans. The investing public in most cities has not been accustomed to fully amortized loans. As the monthly payments under these loans will be considerably higher than the interest payments and partial amortization under the old plan, we wonder

whether this financing plan will offer the psychological inducement it should.

In contrast with the replacement costs within 15 to 20 per cent of the 1926 level, residential rentals are now about 40 per cent below their 1926 level. Net rentals have declined still further because real estate taxes are higher than they were in 1926. Due to this decline in net rentals, and to the amount of distress and foreclosed properties which have been thrown on a disinterested market, prices at which properties can be bought for cash have declined in some instances by a far greater percentage than rentals. It is possible today, in almost every city, to buy desirable residential properties at much less than their replacement costs.

We are inclined to think that a high pressure building campaign may result in some increased building in spite of these facts. We believe that it is within the range of possibility that 1935 may see a volume of residential building as great as three times the 1934 volume. In view of the fact, however, that the 1934 volume, as measured by the number of new family accommodations, was only 5 per cent of the 1927 volume, a maximum tripling of this volume will still leave us far from an amount of new building in 1935 sufficient to re-employ the building trades.

This paper is not to be construed as a criticism of the Federal Housing Administration. It is rather a defense of the relatively slight results it is apt to achieve in the production of new dwelling units during 1935. If its job under Title II of the Act is thought of primarily as an emergency measure to stimulate new building it is bound to be a failure. If it is primarily an effort to build a better real estate financing practice over a period of years, it has a great chance of success.

THE HOUSING PROGRAM OF THE FEDERAL GOVERNMENT: ITS ACCOMPLISHMENTS AND PROSPECTS

By Ernest M. Fisher

There are three forms of governmental activity in connection with housing: (1) educational activities; (2) direct intervention by building and operation of property; and (3) regulatory activities exercised through control of financing and other supervisory devices.

Educational activities have taken primarily the form of studies of housing conditions and the publication of the results. The first and best known project of this sort was the real property inventory conducted by the Bureau of Foreign and Domestic Commerce with the cooperation of the Census Bureau as a Civil Works Administration project in 1934. Closely connected with this project was the financial survey of urban housing also conducted by the Bureau of Foreign and Domestic Commerce in cooperation with the Census Bureau in 1934. These two surveys were conducted in 64 cities varying in size from about 1,000,000 population to 11,000. The surveys were well distributed geographically and by the size and type of communities covered. The results have attracted great attention and have served to focus public interest upon housing problems as has no other event in our history.

Somewhat similar surveys have been conducted in 58 other cities as local work-relief projects. The total population of these cities is in excess of 22,000,000. It is difficult to appraise the merit of these local projects because of the lack of uniformity in the schedules used and in supervision of the work.

It may be confidently stated that public opinion is much better informed than it ever has been in the past regarding housing conditions and is much more concerned with the housing problem. This is an advantage of great importance. It is to be hoped that the state of public opinion is such as to support a periodic census of housing conducted as a regular function of a government department equipped and trained to do the task. This type of census has been conducted at periodic intervals in a number of European countries, notably England, Holland, Germany and Sweden. The information obtained has proved of very great significance from an economic point of view and from the point of view of national planning.

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Direct governmental intervention is being effected through the operations of the Federal Emergency Relief Administration, the

Housing Division of the Public Works Administration and the Subsistence Homesteads Division of the Interior Department. The work of the Housing Division of PWA is being presented in another paper at this meeting and will not be described here.

The FERA is developing three projects which are designed as subsistence homes for the rehabilitation of farm and city families who have no income but who have the capacity and training for small truck farming and who have been stranded by the operation of economic forces over which they have no control. In one of these projects 100 homes have been completed, and 900 homes are under construction in two other projects. In doing this work the FERA provides all buildings, land, implements, live stock, and other equipment. No down payments are required, but prospective occupants of properties are permitted to work during the period of construction and receive credit for this work on the cost of the development. Subsistence grants made during the period of development and until the first crop is harvested, must be repaid in one year. The total cost of each dwelling unit is estimated to be about $2,500. Five per cent interest is charged on all advances; real estate and chattel mortgages are taken on all the property which is provided by the Administration. A mortgage on the first crop is taken for subsistence advanced. The total advanced for land and buildings must be repaid over a period of from 25 to 35 years. Exact terms of sale of property are arranged in connection with each case. Surplus produce raised by families above their needs is purchased by the Administration and credited to the account of the occupant of the property.

The success of this type of enterprise is dependent largely upon two factors: first, the judgment with which prospective purchasers are selected and, second, the development of a neighborhood *esprit de corps* and a community of interest between persons who live in the same neighborhood. If these two problems can be solved this type of activity offers great opportunity for the rehabilitation of families and for introducing them into a new mode of life.

The FERA is also undertaking programs of repair and modernization of unsatisfactory houses in which people on relief rolls are housed. Some of this work is being done in lieu of cash payment of rent and people who are on relief rolls are being used to do the work. This type of coordination of effort commands great admiration.

The Subsistence Homesteads Division of the Department of Interior was allotted a fund of $25,000,000 under the National Recovery Act. Up to December first $18,000,000 of this had been allocated to 62 projects which will provide between 6,700 and 6,800 subsistence

homesteads. Of these projects 42 providing for some 5,000 homes have been commenced; 150 homes have been completed and approximately 1,000 have been completed or contracted for. By December 1, $4,760,000 had been disbursed. The average cost of these homes is estimated at $3,000. An effort is made to secure owners who have independent incomes of between $600 and $1,200 a year. No down payment is required but the entire cost must be amortized in thirty years at 3 per cent interest compounded monthly. The general policies guiding this Division have been expressed elsewhere.[1] The same problems confront the Administration of these enterprises as confront those of the FERA, and the same general executive policies doubtless guide this program.

Indirect intervention of the Government in the housing program is exercised through the operations of the Home Owners' Loan Corporation, the Federal Home Loan Bank system and the Federal Housing Administration. All of these organizations exert an influence on the housing situation through financial control.

The Home Owners' Loan Corporation was set up in 1933 as an emergency measure to extend relief to distressed owners of mortgaged homes who were about to lose their equity through foreclosure. The restrictions placed around the operation of the Act are familiar and need not be here discussed. The report of the Corporation indicates, as at November 28th of this year, the following operations had been completed:

Total number of applications received	1,757,000
Total amount of loans applied for	$5,684,000,000
Average amount of loan applied for	$3,235
Loans closed, as at November 29th	670,423
Total amount of loans closed	$2,021,736,000
Average amount	$3,016

Of the total amount of loans closed only 1.3 per cent was for cash and the balance was represented by distribution of bonds. A recent announcement of the Chairman of the Board stated that no further applications are to be received and the efforts of the organization are to be bent toward disposal of present applications on account of the exhaustion of funds provided by Congress. A further statement of the Chairman of the Board indicated that payments on 30 per cent of the loans which had been advanced by the Corporation are delinquent.

The operations of the Home Owners' Loan Corporation are dis-

[1] See Wilson, L. M. "A New Land-Use Program," *Journal of Land and Public Utility Economics*, Vol. X, No. 1, (February, 1934) p. 1.

tinctly emergency in nature and will undoubtedly decline in the future. It may be taken for granted that there will be delinquencies and subsequent difficulties in securing payment under the agreements made with owners. Such delinquencies, however, and subsequent losses, must be accepted as a part of the program of relief. Undoubtedly this was envisioned when the Act was passed. Compared with the personal suffering and disappointments which have been relieved through the operations of the Act, the losses may be borne without serious criticism. The social advantages obtained through the operation of the Corporation will undoubtedly outweigh any losses which it may suffer.

The Home Loan Bank System was established in 1932 as a system for advancing funds against mortgage securities held by member institutions. Membership of institutions was limited to building and loan associations, mutual savings banks, and insurance companies. Twelve Federal Home Loan Banks were established, the capital stock in which could be subscribed to by the Treasury for resale to the institutions as they qualified for membership. The total capitalization was $148,057,000, of this amount subscriptions of the Treasury totaled $124,640,000. On November 30, 1934, total paid-in capital was $103,427,000 of which $81,645,000 represented capital paid in by the Treasury. Total assets of the twelve banks on November 30, 1934, were $110,478,000. Membership of institutions in Federal Home Loan Banks totaled at that date 2,978 of which 99.6 per cent were building and loan associations. These associations held 95.4 per cent of the assets of all member institutions.

Member institutions can borrow from the Home Loan Bank up to twelve times the amount paid in on subscriptions to stock in the bank. The total line of credit extended to member institutions by the twelve banks amounted on November 30, 1934, to $250,094,000. Loans to member institutions, however, amounted to only $87,107,000, so that the unused line of credit of member institutions was more than 100 per cent greater than their actual borrowings. The twelve banks were operating at a profit in November, 1934, notwithstanding this large unused line of credit available to member institutions. The interest rate to member institutions varied in October, 1934, from 4 to 5 per cent, with a predominant rate of slightly over 4 per cent. Interest rates charged the borrowers of building and loan associations varied from 6 to 8 per cent, and in some instances to 10 per cent. This would appear to be a wide enough margin to induce member institutions to borrow. It is difficult to explain the large unused credit balance, unless it is attributable to the conservatism of build-

ing and loan officers who hesitate to draw on their line of credit in making loans to borrowers.

The Federal Home Loan Bank System represents a method of operation which is essentially sound from the social point of view. Whether the restriction of membership to building and loan associations, mutual savings banks, and life insurance companies is sound, is a debatable question. Notwithstanding this limitation the System may be expected to play a prominent part in the financing of homes and the improvement of housing conditions throughout the country. The type of control exercised is not subject to great political pressure and has proved feasible.

The operations of the Federal Housing Administration began in August, 1934, when Title I, covering the insurance of unsecured loans for modernization and repairs, was put into effect. Since that date in excess of $25,000,000 of unsecured loans have been insured. Reports for October, 1934, showed an increase over October, 1933, of 30 per cent in the number, and 50 per cent in the value of home repair permits issued in 766 cities. It is estimated by close observers that more than $100,000,000 has been expended for repairs and modernization of homes throughout the country. The significant results of this legislation will be measured not only in terms of immediate increase in volume of repair and modernization expenditures but also in the long term effect of the efforts of the Federal Housing Administration in inducing banks and other financial institutions to extend this type of consumer credit. It is likely to become a permanent feature of commercial banking operations and thus to introduce into the field of consumer financing a type of competition which undoubtedly will result in lowering of interest rates and a wiser administration of this type of credit than has existed in the past.

Operations under Title II of the National Housing Act, which deals with the insurance of mortgage loans, began in November, 1934. Regulations have been established and a series of informative circulars perpared and distributed to interested parties. No statistics are available upon these operations, since they started only in November. A study of the regulations and of the Act indicates that the form of control established is feasible and that it has a wide range of possibilities for controlling the operations of private capital in this field. The influence of these regulations should be important in reducing mortgage interest rates and the hazards of both mortgage lending and mortgage borrowing. The control which should be possible under the operations of this Act may go far toward modify-

ing the amplitude of fluctuations in the home building and home value cycles.

One of the distinct characteristics of Title II of the Federal Housing Administration is that it employs no government funds, except a revolving fund for expenses of operation, but depends entirely upon private capital. It is, therefore, distinctly a regulatory or control device, rather than a direct intervention of the Government in competition with private capital.

It seems from the best estimates available that during the decade of the 20's the average annual expenditure on home building was approximately $2,000,000,000. The magnitude of these expenditures is sufficient to indicate the problem involved in direct government intervention. Furthermore, the geographical scope of a national program is so great as to prevent effective operations from a centralized headquarters. It seems reasonable to predict, therefore, that some method of decentralization of governmental responsibility for houses produced by direct intervention will appear necessary. It seems also likely that the scope of these activities will be reduced as the emergency aspects of the present situation diminish in importance.

On the other hand, indirect control may be exercised on an increasing scale. It appears certain that some form of governmental supervision and regulation is very seriously needed. The financial intervention which the Government has already undertaken is on a long term basis and its importance is likely to grow. This type of regulation requires an intimate understanding of the situation on the part of regulatory bodies. Such understanding must be based on much more complete satistical data than have heretofore existed regarding the whole real estate situation. The data necessary for such an understanding are available in considerable quantities and it seems reasonable to suppose that the field is one in which the importance of data will be increasingly recognized.

THE HOUSING PROGRAM OF THE FEDERAL EMERGENCY ADMINISTRATION OF PUBLIC WORKS

By Robert B. Mitchell

The Housing Division of the Federal Emergency Administration of Public Works has been engaged for a year and a half in a demonstration program of low-cost housing. We are working under compulsion of an emergency demanding the immediate provision of employment for workers of the construction industry, in which we include the manufacture of building materials. It has been necessary to initiate action on projects while studying American housing both generally and specifically, to delimit the scope of our activities and to determine how best to fit our projects into the social and economic patterns of the cities in which we place them.

Present-day housing in America may be compared with family transportation in the days before manufacturers discovered how to make an automobile to fit the purse and requirements of the average citizen. New cars were manufactured for the well-to-do, who used them for a few years, until newer and more attractive models were available. Then the old car was sold to Mr. Average Citizen upon a financing plan whereby he paid from 20 to 25 per cent more for it than he should. It was too large for his modest requirements, and it cost too much to run.

Most American citizens live in houses designed—if they were designed—either for different times and a different scale of living, or else primarily for the maximum return of profit to some speculator or landlord. "Real" estate became one of the most fertile fields for the speculator who took his profit (no modest one) on other peoples' investment.

Because there are no fences between the pastures of investment and the no-man's land of speculation, many small investors wander far from safety. Housing finance, by its very nature, has had to be speculative. It has been concerned, generally, with one owner's personal interest in one small parcel of land. Naturally this owner's horizon was the perimeter of his lot. He made it his job to put every possible square inch of his land to work.

In financing his building, he acknowleged that his neighbor was apt to do the same thing. Experience has shown that such an over-built neighborhood would deteriorate rapidly, once the shine of its newness had worn away. Profits had to be taken quickly and amortization

had to be rapid to keep pace with the certain neighborhood obsolescence.

Add to this fundamentally unsound procedure a criminally chaotic mortgage market in which supposedly respectable institutions sold mortgage bonds for more than 100 per cent of total cost on buildings which could not be expected to break even financially. It is no surprise, then, that housing has not been considered an investment; and it is no surprise that decent houses have never been constructed by private enterprise for low-income people.

Our field is limited to a demonstration program. We are building for that part of the population for whom private initiative has been unwilling or unable economically to provide decent homes. Obviously there is a group which cannot be reached in any self-liquidating building project. Therefore, the expected tenancy of Housing Division projects will have family incomes of from $600 to $1600 per year.

We are therefore demonstrating that decent, well planned dwellings can be built for low-income tenancy; that low interest rates and long term amortization are feasible; and we are demonstrating that housing is a sound investment if well planned and on a large enough scale to provide a well integrated community, capable of protecting itself from neighborhood obsolescence.

The original policy of Public Works housing was designed to attract private capital into limited dividend corporations which were eligible to borrow up to 80 per cent of the cost of a project at 4 per cent interest and from 23 to 33 years for amortization. Applications for more than 500 projects were received. Out of this total number only a few were of sufficient merit to warrant development. The remainder were either frankly trying to sell the Government some high-tax vacant land, or were of a highly speculative nature, or could not be classified as non-competitive low-cost housing. This first adventure indicated clearly that local initiative could not be relied upon to develop satisfactory housing projects in time to help alleviate unemployment.

Next, the Administration adopted the policy of initiating projects with the help and guidance of local, interested citizens. It was determined that we should acquire land in the name of the Federal Government because any other agency would find the assembly of such large tracts an endlessly complicated and extremely costly transaction. With no borrowing corporation and consequently no local equity, it is necessary in this program for the PWA to engage archi-

tects and construct the projects. It is under this policy that the present program is being developed.

The Housing Division has never yet initiated a project in any city without a strong invitation to do so from representative local citizens. The sum of approximately one hundred fifty million dollars available for our work has long been budgeted for immediate use in the first forty cities to apply where projects could be justified.

The process of developing a project is essentially simple. The Housing Division organization is divided into five branches, each responsible to the Director, Colonel Horatio B. Hackett.

Branch I is that of Initiation and Recommendation. Its name is expressive of its duties which run from the first preliminary contacts in a city until a specific project is formulated as far as approval of preliminary architect's sketches.

Branch II, designated Plans and Specifications, is organized with assistants qualified in architecture, landscape architecture, structural and mechanical engineering, to undertake research into standards of cost, materials and methods, and to supervise the work of local technicians in the development of projects along sound technical lines.

Branch III is Land Acquisition. To this part of our organization is assigned the tremendous task of assembling at fair prices large tracts of urban land. Preliminary and incidental to this work is that of securing appraisals, title certificates, physical surveys, and aerial photographs.

Branch IV is Construction. Its duty is to supervise bidding and the letting of demolition and building contracts and, in cooperation with another Division of the Public Works Administration, to supervise construction to a point where the projects are complete and ready for occupancy.

Branch V, Management, has been set up to undertake research into problems of upkeep, maintenance and project management, including the social relationships with tenants. Its functions will include as well the training of properly qualified managers and supervision of local management organization. Housing is not an end in itself. It is a means toward the rehabilitation of families. We fully realize that the success of public housing in this country will be dependent largely on its management.

An administrative staff and a corps of legal advisers to guide us through the task of accomplishing a new kind of job in accordance with Government procedure and our legal limitations complete the organization.

When an organization in some city makes an inquiry about the

possibility of establishing a project there, we send a preliminary questionnaire concerning the housing need and other conditions in that city, upon the basis of which we are able to determine whether or not a project would be justified in that place. If so, we send a representative there to investigate local conditions, establish contacts with the municipal administration and other responsible citizens and guide local study to provide us with answers to a detailed outline of social, economic and physical data necessary to the intelligent formulation of projects.

The outline is very comprehensive in nature and rarely can be answered in its entirety by any community out of information on hand. In addition the number of answerable and pertinent items varies considerably with the size of the community in question. In any case, however, it should be realized by the local communities that a continued and successful housing program must be based on a much more adequate knowledge of city planning, sociology and urban economics than has existed to date.

When more detailed information has been assembled and digested we may decide for what particular racial and economic groups a project should be designed, the extent of the need, the approximate rentals to be charged, and the type of housing best suited to the locality and family sizes—a quite different procedure, it may be remarked, from that followed by the speculative builder in his operation.

Meanwhile, the local architects have been selected for the design of the project. This is done according to a program previously prepared, and under the supervision of the Housing Division. Contracts are let after competitive bidding for the demolition of existing structures on the site, and eventually for the construction of the project.

While this preliminary work is being done, we form a local advisory committee of responsible and representative citizens in order to be sure that the local viewpoint on all major questions will be heard. When the fundamental characteristics of a project have been determined and a preliminary cost and operating statement has been prepared and approved, we are ready to begin direct action. The Branch of Land Acquisition sets to work to acquire the site, using local agents under our supervision. When options have been secured by private negotiation on all parcels which can be bought at a fair price, a petition of condemnation is filed in the Federal Court for the remainder.

In localities where there are local authorities established by the state with the right to own and operate housing, the Government consults with these bodies in the execution of the project. Upon

completion the project may be sold or leased to the local authority. Where there are no such public bodies, the projects may be leased to local non-profit corporations established with the aid of our advisory committees for the purpose of management.

It is one thing to discuss the general theory of housing, so long recognized as a public responsibility by most European nations. It is another to develop ways and means of executing housing projects with widely divergent conditions and wholly different needs and to solve enroute problems of fundamental policy. It is still more difficult to be pushing work to relieve unemployment at the same time that ways and means are being devised. Nevertheless, I can report to you very definite accomplishments.

Today construction is under way on six limited dividend projects initiated privately in the early days of the Division's existence. Actual constructon will commence shortly in Atlanta on the first of the Federal projects. The long process of land acquisition is in varying stages of completion on twenty-three others. Only eleven of these have been announced to date because of the necessity of extreme caution to prevent speculation in real estate on project sites. These projects actually under way will house approximately 80,000 people at rentals ranging between $9.00 and $27.00 per family per month, without heat or service, depending upon location, size of living unit and type of tenancy anticipated.

A very real achievement in over fifty cities has been the awakening of public interest and appreciation of the housing problem and of the need for a more fundamental city planning based upon human values. It is our hope that as the program develops more and more the initiative can be assumed by local communities. We believe that the chief contribution of the Housing Division will be in helping the cities of America to know themselves, and to become better places for people to live.

Minutes of the
Annual Business Meeting
and Reports of
Officers, Committees
and Representatives

MINUTES OF THE ANNUAL BUSINESS MEETING

A business meeting of the American Statistical Association was held on Thursday, December 27th, 1934, at 9:00 A.M. at the Palmer House, Chicago, Illinois. President Frederick C. Mills presided.

The report of the Committee on Government Statistics and Information Services was read by Frederick F. Stephan. The report was accepted.

The report of the Committee to Stimulate and Coordinate Research was also read by Frederick F. Stephan. It, too, was accepted.

The report of the Committee to Arrange for a Meeting of the International Statistical Institute in the United States in 1939, was read by Walter F. Willcox. It was accepted.

A motion was carried authorizing the Board of Directors to take whatever action may be necessary in making arrangements for the 1939 meeting of the International Statistical Institute in the United States.

A report of the Committee on Census Enumeration Areas was read by Howard W. Green. This report was accepted.

A motion was carried reaffirming the action of the American Statistical Association in 1933 and reiterating the resolution which had been adopted —namely that:

> RESOLVED that the American Statistical Association in view of the unusual movements of population resulting from the present depression, reaffirms its opinion, expressed by resolution at the Annual Meeting of 1932, of the desirability of a special census of population, to be taken intermediate between the decennial enumerations of 1930 and 1940. It hereby instructs its officers to bring this opinion to the attention of the proper authorities, and to take all steps available to them, on behalf of the Association to secure such a census.

George H. Van Buren, representative of the American Statistical Association on the National Conference on Nomenclature of Disease reported on the activities of that conference during the year. The report, as read by the Secretary of the Association, was accepted.

Horatio M. Pollock suggested the desirability of amending the existing Nomenclature in a manner such that small hospitals might find it easier to use it.

Donald R. Belcher, representative of the American Statistical Association on the Business Research Council, reported for that organization. His report was accepted.

The Secretary of the Association read the report of the Committee on Fellows signed by S. L. Andrew. The Committee elected Walter A. Shewhart and William A. Berridge fellows of the American Statistical Association.

The Secretary of the Association read the report submitted by Professor Edwin R. A. Seligman for the Joint Committee on the Encyclopaedia of the Social Sciences. The Secretary was instructed to extend, on behalf of the Association, hearty congratulations and thanks to Professor Seligman and

members of his editorial staff for the completion of the monumental work entrusted to their hands.

The Secretary of the Association read the report of the representatives of the American Statistical Association on the Social Science Research Council. The report, which was signed by Edgar Sydenstricker, was accepted.

John H. Cover presented the report of the State Committee for Illinois. It was accepted.

Theodore H. Brown, Chairman of the Committee on Statistics on Business presented the report of that committee. This report was accepted.

The Secretary of the Association read the report of the Committee on Delinquents and Criminals. This report, which was signed by Thorsten Sellin, was accepted.

The meeting adjourned.

A business meeting of the American Statistical Association was held on Friday, December 28th, 1934, at the Palmer House, Chicago, Illinois. President Frederick C. Mills was in the chair.

A report of the Committee on Statistics of Relief and Child Care was read by Neva R. Deardorff and accepted.

A report of the Committee on Statistics of Institutions for Mental and Physical Disorders, presented by Horatio M. Pollock, was accepted.

The Secretary of the Association read a report signed by Walter A. Shewhart, representative of the American Statistical Association on the Joint Committee for the Development of Statistical Applications in Engineering and Manufacturing. This report was accepted.

Alexis Sommaripa read the report of the Committee to Inquire into the Question of Calendar Reform. It was accepted.

The Secretary read a report signed by Malcolm C. Rorty as representative of the American Statistical Association on the Board of Directors of the National Bureau of Economic Research. The report was accepted.

The meeting adjourned.

A business meeting of the American Statistical Association was held on Saturday, December 29th, 1934, at the Palmer House, Chicago. President Frederick C. Mills was in the chair.

The following amendments to the Constitution were passed and transmitted to the Annual meeting of 1935 for final consideration:

Article VI shall be amended striking out the words in Line 5 "at the Annual Meeting" and also the word "and" in Line 6.

Article VIII shall be changed to read:

> The officers of the Association shall be nominated and elected from the membership of the Association and shall consist of a President, a Secretary-Treasurer, six other Directors, not more than eight Vice-Presidents and the Editor of the Journal. Each of the Vice-Presidents shall be elected to represent a distinct field of statistical interest, the field to be represented by each to be designated by the Board of Directors before the date when the nomination for that position is made. The President, Vice-Presidents, Sec-

retary-Treasurer, and Editor shall be elected each year at the Annual Meeting, the manner of their election being prescribed in Article IX. The six Directors other than the President and Secretary-Treasurer, shall be elected at the Annual Meeting at which this amended Constitution is adopted, two for a term of one year, two for two years, and two for three years. Thereafter, two Directors shall be elected each year for a term of three years, the manner of their election being prescribed in Article IX. These Directors shall not be eligible for re-election until one year has elapsed after leaving office. All elected officers shall take office at the close of the Annual Meeting at which elected. The President, Directors, and Secretary-Treasurer shall form a Board of Directors for the government of the Association, three of whom shall constitute a quorum at any meeting regularly convened. The Vice-Presidents shall constitute advisors to the President and Secretary in the preparation for annual and special meetings, and in matters concerning the interests of the groups they represent in the membership of the Association.

In case of the incapacity of the President to act on any occasion, the Secretary-Treasurer shall designate which of the Vice-Presidents shall act as President.

Article IX shall be amended to read as follows:

The President, Secretary-Treasurer, other Directors, Vice-Presidents, and the Editor of the Journal shall be elected in the following manner. The President shall appoint a Nominating Committee of three members, the personnel of which shall be announced in the quarterly publications of the Association at least three months before the Annual Meeting. It shall be the duty of the Nominating Committee to make nominations for officers to be elected at the Annual Meeting and to notify the regular members and fellows by mail of its nominations at least thirty days before the Annual Meeting. Twelve or more regular members or fellows may make nominations for any office by submitting signed petitions to the Secretary of the Association not less than twenty-four hours before the beginning of the business meeting at which the election is scheduled to take place. In case a nomination by petition is made, the Nominating Committee may present to the Annual Meeting the names of one or more additional nominees for the same office.

When but one person has been nominated for a given office, that person may be elected at the Annual Meeting by a *viva voce* vote. If there are two or more nominations for the same office, it shall be the duty of the Secretary to announce such nominations, and, in this case, the election for this office shall be by secret ballot, and the President shall appoint three judges of election who shall count the ballots, shall decide any questions that may arise as to the validity of any ballot, and shall declare the results of the election. The candidate for any position, receiving a plurality of votes cast for that office shall be declared elected. The President shall vote only in case of a tie vote, in which event he shall cast the decisive ballot.

By-law 4 was amended to read:

4. The Board of Directors, as soon as practicable after their election, shall appoint five Associate Editors to aid the Editor of the Journal and Proceedings in editing these publications. The Associate Editors shall serve for one year or until their successors are appointed.

The Secretary of the Association read the report of the Census Advisory Committee signed by Edmund E. Day. It was accepted.

The Treasurer of the Association read his report and the report of the Auditing Committee. Both of these reports were accepted.

The Secretary of the Association read his report. It was accepted.

The following resolutions were adopted:

WHEREAS this year marks the fifteenth anniversary of the National Bureau of Economic Research; and whereas, during its fifteen years of existence, the Bureau has made most notable contributions in the field of Statistics; and whereas, during the entire period, the American Statistical Association has been most ably represented by Colonel Malcolm C. Rorty acting as a Director of the Bureau;

Now, therefore, be it resolved that the members of the American Statistical Association assembled in annual convention convey to the National Bureau of Economic Research and to our representative, Colonel Rorty, our appreciation of their achievements.

RESOLVED that the American Statistical Association expresses to the management of the Palmer House its appreciation of the quality of the service rendered during the Annual Meeting of 1934.

RESOLVED that the American Statistical Association heartily congratulates President Frederick C. Mills on the outstanding merit of the program which he arranged for the Annual Meeting at Chicago and thanks him for the preparation of this program.

RESOLVED that the American Statistical Association extends a hearty vote of thanks to Mrs. Bernice Lamb, Mr. Ray D. Kinkaid, and the other members of the local committee on arrangements for their arduous and effective work in preparing the joint announcements, in making plans for the meeting, and in looking after the numerous details connected with the Annual Meeting at Chicago.

WHEREAS, the loyal devotion of Willford I. King to the American Statistical Association, given without stint during a decade of continuous service as Secretary-Treasurer, has been an important factor in its growth in membership, responsibility, and influence; and through the Association has left a permanent mark upon American statistics; and

WHEREAS, Dr. King's invaluable services in that office have now come to an end with his election to the presidency of the Association; be it

RESOLVED, that the American Statistical Association conveys its grateful appreciation to Willford I. King, and expresses to him its affectionate esteem as an inadequate recompense for the debt which it owes him; and directs that this resolution be made a part of the records of the Association.

The following nominations were made by the Nominating Committee:

President:	Willford I. King
Vice-presidents:	Aryness Joy
	Harry C. Carver
	Mary van Kleeck
	Herbert A. Toops
	Simon Kuznets
	Theodore H. Brown
	Woodlief Thomas
	Roland S. Vaile
Directors:	Frederick C. Mills
	Frank A. Ross
Secretary-Treasurer, and Editor:	Frederick F. Stephan

All nominees were elected by *viva voce* vote.

The meeting adjourned.

WILLFORD I. KING, *Secretary*

REPORTS

Report of the Secretary

Membership, December 1, 1933		1,649	
Additions during 1934 (including 26 former members unable to pay dues but reinstated at their request without receiving the Journal).	195		
Deductions during 1934:			
Deaths	13		
Resignations	74		
Dropped or suspended for non-payment of dues	134		
	221		
Net loss in membership during 1934.....		26	
Membership, December 1, 1934			1,623
Besides members, we have:			
JOURNAL subscribers, mostly libraries	474		
JOURNAL, domestic exchanges	22		
JOURNAL, foreign exchanges	25		
			521
Total members, subscribers, and exchanges...			2,144

The following deaths were recorded during the year:

Mr. Richard R. Bowker	Mr. Byron H. Holt
Mr. John C. Cobb	Mr. Kenneth Johnson
Professor Henry W. Farnam	Dr. Jorge Le Roy
Mr. Edwin E. A. Fisher	Dr. Lucian March
Mr. Jeptha Garrard	Mr. Franklin B. Mead
Dr. Joseph W. Hayes	Mr. J. E. Sterrett

Mr. Walter Wood

Four numbers of the JOURNAL containing 456 pages, together with the PROCEEDINGS Supplement containing 240 pages, have been issued in 1934. These compose Volume XXIX. There were ten pages of paid advertising in the four issues of the JOURNAL.

Previous to the present Annual Meeting in Chicago, the Association has held during the year nine dinner and luncheon meetings in New York City, the average attendance at these meetings being 72.

We have reports of meetings held by district organizations as follows:

Chapter	*Number of Meetings*	*Average Attendance*
Albany	5	27
Boston	0	0
Boston	3	29
Chicago	6	54
Cleveland	8	23
Columbus	5	24
Connecticut	4	68
Los Angeles	5	2
Philadelphia	4	30
Pittsburgh	12	21
San Francisco	5	38
Districts		
*Detroit		
Washington	1	150

WILLFORD I. KING, *Secretary*

* Report not received.

Report of the Treasurer, Covering the Period December 1, 1933 to November 30, 1934

Gross Receipts and Disbursements

Cash on hand December 1, 1933	$529.12	
Gross cash receipts during year	17,235.20	
		$17,764.32
Gross cash disbursements during the year		15,987.22
Cash on hand November 30, 1934		$1,777.10
Gross cash disbursements during year	$15,987.22	
Refunds and adjustments	912.31	
Gross expenses		$15,074.91

Functional Apportionment of Gross Expenses (Including Overhead)

Annual meeting and New York meetings	$2,628.33	
JOURNAL and PROCEEDINGS	8,499.29	
ANNALS	176.98	
Employment Clearing House	563.11	
Securing new members	431.79	
Committees and work connected therewith	906.30	
Miscellaneous	947.91	
Dues collection	921.20	
		$15,074.91

Net Receipts and Disbursements

Cash on hand December 1, 1933		$529.12
Gross cash receipts	$17,235.20	
Refunds and adjustments	1,690.43	
Net cash receipts during year		15,544.77
Total		$16,073.89
Gross cash disbursements during year	$15,987.22	
Refunds and adjustments	1,690.43	
Net cash payments during year		14,296.79
Cash on hand November 30, 1934		$1,777.10

Itemized Statement of Net Receipts and Disbursements

Cash on hand December 1, 1933		$529.12

Net Cash Receipts

Individual membership dues		$7,874.07	
Contributing membership		25.00	
Corporate dues		700.00	
Subscriptions to JOURNAL		2,997.63	
JOURNAL sales		506.54	
Advertising		278.00	
Receipts from authors for reprints		348.27	
New York meetings		905.85	
Committee on Calendar Reform		500.00	
Interest on bonds and deposits		227.80	
Dividends		321.50	
Special contributions		513.00	
Sale of books to members:			
Statistics in Social Studies	$4.57		
American Agricultural Villages: 1930 (Monograph No. 1)	76.20		
4 Vol.—President's Committee on Social Trends	84.35		
Miscellaneous books	164.20		
		329.32	
Miscellaneous receipts, Secretary's office		17.79	
Total net receipts			$15,544.77
Total			$16,073.89

Net Cash Disbursements

Cost of JOURNALS:			
December, 1933, edition, including reprints	$877.91		
March, 1934, edition, including reprints	908.48		
PROCEEDINGS, including reprints	1,597.83		
June, 1934, edition, including reprints	934.52		
September, 1934, edition, including reprints	808.51		
		$5,127.25	
Printing, postage, and stationery		1,213.81	
Salaries		5,926.25	
Rent		388.40	
New York meetings		587.16	
Telephone and telegraph		96.46	
Annual meeting		190.33	
Miscellaneous expenses, Editor's office		195.00	
JOURNALS bought back		44.75	
Cost of shipping JOURNALS		121.79	
Expenses, Committee on Calendar Reform		173.14	
Books sold to members:			
Statistics in Social Studies	$1.10		
4 Vol.—President's Committee on Social Trends	14.88		
Miscellaneous books	137.30		
Miscellaneous expenses, Secretary's office		79.17	
Total net disbursements			$14,296.79
Cash in checking account, Corn Exchange Bank, November 30, 1934	$1,256.20		
Cash in Emigrant Industrial Savings Bank	350.62		
Cash and checks on hand, not deposited	170.28		
			1,777.10
Total			$16,073.89

On November 30, 1934, the Association possessed, in addition to stationery and miscellaneous supplies, the following assets:

Cash on hand	$1,777.10
Furniture carried at	263.00
JOURNALS and PROCEEDINGS, 8,289 copies having value, plus 4,829 excess copies	
Bonds, market value, November 30, 1934, plus accrued interest	5,057.50
Common (guaranteed) and preferred stocks—market value November 30, 1934	3,420.50

All bills presented to the Treasurer have been paid:

Of the $1,777.10 cash specified above, $326.86 belongs to the Committee on Calendar Reform.

WILLFORD I. KING, *Treasurer*

Report of the Auditing Committee

We have examined the books and records in the office of the Treasurer of the American Statistical Association and have verified the bank balances.

We hereby certify that the Treasurer's report submitted is in accordance with the books and records, and, in our opinion, correctly represents the financial condition of the American Statistical Association as of November 30, 1934, and receipts and disbursements during the year December 1, 1933, to November 30, 1934.

R. PARKER EASTWOOD
SOLOMON FABRICANT

New York, N. Y.
December, 1934

Report of the Committee on Fellows

The Committee on Fellows, after making the canvass directed by Article V of the Constitution of the Association, has by unanimous vote elected Walter A. Shewhart and W. A. Berridge Fellows of the American Statistical Association.

IRVING FISHER
W. L. CRUM
W. F. OGBURN
E. A. GOLDENWEISER
S. L. ANDREW, *Chairman*

Report of the Committee to Arrange for a Meeting of the International Statistical Institute in the United States in 1939

The "Committee to Arrange for a Meeting of the International Statistical Institute in the United States in 1939," when the American Statistical Association will celebrate its centenary, believes that no such meeting should be arranged unless the United States Government, following the practice of other countries, invites the Institute to meet in this country. If an official invitation is to be extended and accepted, it must be presented at the meeting of the Institute to be held at Athens in September 1936. An effort to pave the way for such an invitation will be made early in 1935. Preliminary correspondence regarding it is now in progress.

A grant of $9,000 has been made by the Carnegie Corporation of New York to the American members of the International Statistical Institute in order to facilitate their participation in the Athens meeting and preliminary committee meetings. Encouraged by this support, the committee and other American members of the Institute are ready for the next move.

E. DANA DURAND
HAVEN EMERSON
WALTER F. WILLCOX, *Chairman*

Report of the Joint Advisory Committee on the Census

The Joint Advisory Committee of the American Statistical Association and the American Economic Association held two meetings in 1934, one on April 21 and the other on December 14 and 15.

At the April meeting one of the subjects that came up for consideration was that of checking and improving the birth and death registration, the evidence submitted indicating that in many states the registration was seriously deficient and probably fell below the 90 per cent standard required for admission to the registration area. The Committee passed the following resolution:

> WHEREAS, the registration areas for births and deaths have now been completed after more than thirty years of persistent effort by the Bureau of

the Census, aided by the American Public Health Association and other organizations; and

WHEREAS, the integrity of this achievement is threatened by retarded, incomplete and defective registration in a number of states; and

WHEREAS, further progress in vital statistics demands closer cooperation between the Bureau of the Census and the various state registration offices, to the end of protecting and strengthening the birth and death registration;

BE IT RESOLVED, that the Bureau of the Census should be authorized, and provided with funds, to employ a limited number of special field agents to represent the Bureau in the development of such cooperation, and in maintaining effective supervision over the registration areas.

The Director of the Census has taken this matter up and asked for authority and funds to enable him to appoint a limited number of qualified men on vital statistics work, who could be employed part of the time in the office in Washington and the rest in the field.

Another matter brought to the attention of the Committee was that of having the Bureau prepare life tables as it did following the censuses of 1910 and 1920. On this question the Committee passed the following resolution:

RESOLVED, That the Director of the Census be advised that it is the opinion of the Advisory Committee that the work on life tables already begun should be continued and completed; and that a committee of high authority in the actuarial field be consulted as to the validity of the methods employed and the results obtained.

As regards the printing situation, the Committee found that while funds for completing the printing of the Fifteenth Census reports had been provided and these reports had all been printed, the Bureau still had no funds for printing the 1931 and 1932 regular annual reports on mortality statistics, birth statistics, and financial statistics of cities, nor for printing the complete report on the 1931 biennial census of manufactures. In view of this situation the Committee passed the following resolution:

WHEREAS, the Committee finds that no provision has yet been made for printing the 1931 and 1932 regular annual reports on mortality statistics, birth statistics, and financial statistics of cities, although the data for these reports have been compiled in regular course as provided by law, the tabulations completed, and the manuscript prepared for the printer; and

WHEREAS, the Committee finds also that there is no provision for printing a complete biennial report on Manufactures for the year 1931, and that all that has been published thus far for that census is a series of printed pamphlets aggregating about 270 pages supplemented by a series of mimeographed press releases, making a very poor substitute for the cloth-bound octavo volume of about 1,500 pages regularly printed for the biennial censuses of 1921, 1923, 1925, and 1927; and

WHEREAS, so long as the above mentioned reports are not printed, statistics of incalculable value relating to such important subjects as population growth, health, public finance, and manufactures will remain unavailable.

BE IT RESOLVED, that this Committee commends and will be glad to support or assist in any way it can the efforts being made by the Director of the Census and the Secretary of Commerce to secure the funds needed for the printing of these valuable reports; but

BE IT FURTHER RESOLVED, that this Committee can but deplore and criticize a condition under which, as here illustrated, valuable and costly statistical surveys required or authorized by law are undertaken and con-

ducted without any assurance or certainty that adequate funds for printing will ever be provided.

The question of the form and content of the annual reports on vital statistics was on the agenda for this meeting but the Committee were of the opinion that this was a question which should be referred to a committee specially organized for that purpose. Other subjects which were brought to the attention of the Committee but on which they made no specific recommendations included the situation of the 1933 census of manufactures and the plans for the quinquennial census of agriculture.

When the Committee met again in December it was gratified to find that funds had been provided for printing the delayed reports; that the report on the biennial census of manufactures would be a volume of about 1,300 pages similar in scope and detail to the printed reports of the previous biennial censuses; that the seven volumes covered by the resolution passed at the previous meeting had all been sent to the printer and that five of them had been released for printing and one already printed. On the other hand, it found that the funds available for printing the reports of the current year were quite inadequate. It passed the following resolution relative to this situation:

> WHEREAS, the Committee on two occasions passed resolutions deploring the fact that the printing funds allotted to the Census Bureau had not in the past been sufficient to insure the complete and prompt publication of its reports; and
>
> WHEREAS, the Committee is gratified to learn that since its last previous meeting in April the Secretary of Commerce has secured funds to provide for the printing of the delayed annual reports on vital statistics and financial statistics of cities, and also the biennial report on the census of manufactures; and
>
> WHEREAS, the Committee finds that these reports have now all gone to the printer and that one of them is already printed,
>
> BE IT RESOLVED, that in view of what the Secretary of Commerce has already accomplished in securing needed funds for printing and of the interest he is manifesting in the work of the Census Bureau, the Committee feels that it can rest assured that every effort will be made to correct the present unfortunate situation in which the funds available to the Bureau are still insufficient to provide for printing all the reports that will be completed in the current fiscal year; and
>
> BE IT FURTHER RESOLVED, that copies of this and the previous resolutions passed by the Committee on the subject of printing be transmitted by the Chairman of the Committee to the Secretary of Commerce.

At this meeting the Committee was invited to pass upon a report that had been prepared and submitted to the Director of the Census by a committee of the Central Statistical Board making certain recommendations regarding Bureau policies, positions, and organization units. These recommendations related mainly to a better system of cost accounting, keeping better personnel records, and measures for improving the efficiency and organization of the personnel of the Bureau. The Committee passed a resolution approving in general the recommendations in this report "subject

to the certain qualifications as stipulated by the Assistant Secretary of Commerce in a memorandum to the Secretary of Commerce and approved by the latter." It passed also the following resolution stressing the importance of a specific recommendation:

> RESOLVED, that this Committee, having examined the Final Recommendations of the Central Statistical Board to the Bureau of the Census on Certain Bureau Policies, Positions and Organization Units, dated October 19, 1934, is particularly impressed with the importance of recommendation 5, reading as follows:
>
> "That special attention be given to the need for professionally trained persons for work of a professional character in the Bureau."
>
> The Committee therefore recommends that the Bureau of the Census endeavor to fill vacancies in its staff wherever possible by professionally trained personnel; and that it prepare plans for relating research functions to functions of statistical production and administration in such ways as to provide continuous employment for a technically trained staff. The Committee further recommends that efforts be made by means of a review of the Bureau's existing personnel classification and by means of adequate appropriations for positions which are now or which subsequently become vacant in the Bureau to attract and retain personnel of the highest professional competence on the Bureau's staff. The Committee solicits for the Bureau, to assist it in accomplishing these objects, the continued support of the Secretary of Commerce, the Congress, the Bureau of the Budget and the Civil Service Commission, and expresses its gratification for the sympathetic attention which these have already given to the Bureau's needs.

The Committee also passed a resolution approving a report on the field service of the Bureau which had been prepared and presented to the Director by representatives of the field staff of the Civil Service Commission acting as special agents of the Census Bureau.

The Committee passed resolutions recommending that legislation be sought to provide for quinquennial and annual censuses of manufactures and for a biennial census of trade and services. It went on record as being in favor of taking a census of population in the year 1935. Bills covering all these projects had already been drafted ready for submission to Congress at the coming session.

The Committee gave some consideration to the general question of what the function and organization of a census advisory committee should be, having in mind certain proposals that had been made informally for reorganizing the present committee with a view to making it more representative. The Committee felt that the subject required further study and will later submit recommendations regarding it.

EDMUND E. DAY, *Chairman*
Representatives of the American Statistical Association:
ROBERT E. CHADDOCK
PAUL T. CHERINGTON
WILLFORD I. KING

Report of the Committee to Stimulate and Coordinate Research

The effectiveness of the Association in the improvement of statistics and the promotion of research depends upon its committee structure and personnel. The creation and stimulation of vigorous committee activity in the principal fields of statistics is a matter of prime importance to the Association.

At annual meetings in the past it has not been possible to consider or appraise committee reports before the committee layout for the coming year was crystallized. To facilitate a proper review of committee work, the Committee on Research in April proposed a code of procedure which since has been approved by the Board of Directors, as follows:

(1) The committee year shall be from March 1 to the end of February of the following year, and the appointment of existing research committees is hereby extended to February 28, 1935.

(2) Research committees shall be appointed annually at a meeting of the Board following the annual meeting and preceding the beginning of the committee year, in order that a careful appraisal of work may be completed after the annual reports of the committees have been filed at the time of the annual meeting.

(3) The chairman of each research committee shall submit a tentative program of work to the Board of Directors on April 1 of each year, copies to be transmitted promptly from the office of the Secretary-Treasurer to the chairman of the Committee on Research.

Immediately following the annual meeting the reports of the several research committees will be reviewed by the Committee on Research and recommendations based on this review will be submitted to the Board of Directors.

The field committees of the Association during the year have been actively concerned with the problems of calendar reform, the statistics of business, of relief and child care, mental and physical disorders, delinquents and criminals, and with development of census enumeration areas. The intensive work of the Committee on Government Statistics and Information Services is covered in a separate report, and is described at some length in the December JOURNAL.[1]

Following an extensive canvass of opinion it is expected that the Committee of Inquiry into the Question of Calendar Reform will clarify the Association's position in this controversial field. The Committee on the Statistics of Relief and Child Care has been aided by the facilities of the Welfare Council of New York, and has continued its close contact with the work of the United States Children's Bureau, with the Division of Research in the

[1] See JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION, December, 1934, pp. 394-405.

Department of Welfare of the State of New York, and other organizations. Further progress toward general improvement and standardization of reporting has been stimulated by the Committee on the Statistics for Mental and Physical Disorders.

In June, the Committee on Delinquents and Criminals participated in a conference in Washington, on the Federal statistics of crime and law violation, sponsored by the Committee on Government Statistics. Since the conference a recommended program in this field has been submitted to the Attorney General by the latter Committee. The internal statistical problems of business corporations have been considered by a new Committee on Business Statistics which will report for the first time this year.

During the year, the work of the Bureau of the Census has been subjected to careful study by the Committee on Government Statistics in collaboration with the Central Statistical Board. The Committee on Census Enumeration Areas continues to foster the development and use of census tracts in statistical enumeration.

The Committee on Research has given some thought to the role of the Advisory Committee to the Census, and has recommended to the Board that the Association undertake to reconstitute the Advisory Committee on a new basis, that its members should be appointed jointly by the collaborating Associations for annual terms, and that it should proffer advice and undertake inquiries on its own initiative.

The Committee on Research has recommended the creation of a Committee on Statistical Theory and Technique and has suggested that the feasibility of an annual review of the literature on statistical technique be carefully explored by the new editor of the JOURNAL. It urged the encouragement of thorough collegiate training in mathematical statistics for prospective social scientists.

During the current year, a number of fields of active Association interest have been temporarily referred for active exploration by the Committee on Government Statistics and its affiliate, the Advisory Committee to the Secretary of Labor. During 1935 the creation of new special committees should be considered in the field of real estate and construction, commodity statistics (prices and commodity volume data), population, vital statistics, health, medical care, education, and other fields. In these fields which involve the development of government data attention will be given to relation of Association Committees to the committee and staff organization of the Central Statistical Board.

MEREDITH B. GIVENS, *Chairman*
BURTON H. CAMP
MORRIS A. COPELAND
W. LEONARD CRUM
NEVA R. DEARDORFF
HORATIO M. POLLOCK
MARY VAN KLEECK

Report of the Committee on Government Statistics and Information Services

Jointly Sponsored by the American Statistical Association and Social Science Research Council

The resident work of the Washington staff of this Committee formally terminates December 30, and a final report now in preparation is to be transmitted to the Boards of Directors of the Committee's scientific and financial sponsors as of January 1st. This report is to be distinguished from summary reports being submitted also to the Secretaries of the several Federal Departments which participated in the original invitation to the Committee's sponsors.

The activities of the Committee will continue, however, into the new year. At its annual conference (Lake George, September 16–21, 1934) the Social Science Research Council voted "that the Committee on Government Statistics should be continued on a joint basis with the American Statistical Association." This continued sponsorship provides for the defraying of limited expenses in accordance with the Council's usual procedure with its committees. The Executive Secretary continues to represent the Committee on the Central Statistical Board.

Upon authority of the two sponsoring organizations the membership of the Committee for the Fall Quarter was named as follows:

Frederick C. Mills, *Chairman*	Ewan Clague
Donald R. Belcher	J. Frederic Dewhurst
Murray R. Benedict	Bryce M. Stewart
William J. Carson	Samuel A. Stouffer
Robert E. Chaddock	Ralph J. Watkins

Meredith B. Givens, *Executive Secretary*

The Committee's special budget is exhausted at the end of the year. Approximately sixty persons have been members of the staff at various times since the beginning of the Committee's resident work in Washington.

In addition to its own special budget, the Committee has authorized disbursements in behalf of the Social Science Research Council under two Foundation grants, for a study of retail price reporting supervised by an interdepartmental committee of the Central Statistical Board, and for a study of the statistics of payroll attachments conducted by the U. S. Bureau of Labor Statistics.

An extended synopsis of the activities of the Committee on Government Statistics and Information Services appears in the December issue of the JOURNAL, and it is expected that the Committee's final report will be summarized in a later issue.

MEREDITH B. GIVENS, *Executive Secretary*

Report of the Advisory Committee to the Secretary of Labor

The activities of the Advisory Committee to the Secretary of Labor are reviewed briefly in the summary of the work of the Committee on Government Statistics and Information Services in the December issue of the JOURNAL (see pp. 394–404).

No general meetings of the Committee have been held during the Fall Quarter but the attention of members and staff has been concentrated on the preparation of definitive recommendations covering the various phases of the work of the year. An Interim Report was submitted to the Secretary of Labor in the spring of 1934, and a complete summary of the Committee's activities will be included as an important part of the more comprehensive report of the Committee on Government Statistics and Information Services, with which the Advisory Committee is affiliated.

A close working relationship has been maintained with the Bureau of Labor Statistics, and the attention of the Committee has been drawn in part to the consideration of problems of immediate and pressing interest to the Bureau. For example, preliminary reports on the statistics of industrial accidents and labor turnover have been prepared, and advice and assistance have been given in planning the cost of living work of the Bureau of Labor Statistics, and in providing for the revision of the index numbers of the cost of goods purchased by wage earners.

The resident activities in Washington have been made possible by funds supplied through the Committee on Government Statistics and Information Services. The initiation of new work has ceased since January 1, 1935, but it is planned that the Committee shall continue to function, at least for the time being, and occasional meetings will be held in Washington.

The present membership of the Committee is as follows:

BRYCE M. STEWART, *Chairman*
MORRIS A. COPELAND
J. FREDERIC DEWHURST
MEREDITH B. GIVENS
RALPH G. HURLIN
ARYNESS JOY
MURRAY W. LATIMER
EWAN CLAGUE, *Secretary*

Report of the Committee on Statistics in Business

The Committee appointed to consider the problems of statistics in business has judged that its work was principally that of considering what might be done to further the work of the Association in this direction.

The difficulties of the problem lie first in the fact that much in the way of statistical technique which improves business operations often is retained as confidential by the business executive, since it tends to provide a commercial advantage. The university worker frequently does not have the intimate relation with businesses which would make possible a knowledge of the very

confidential problems and data which are involved. The American Statistical Association, in turn, by its policy seeks to avoid the implication of endorsing business procedures which at least in their earlier stages may be of a wholly controversial nature and which, in consequence, may prove to be exceedingly profitable or unprofitable to the businesses adopting them.

In view of these facts the Committee believes that if possible the Association might encourage the publication of monographs which might be of help to business men. It believes also that temporary preference might be given in the JOURNAL for publication of the articles of a business character. Finally, it seems wise that encouragement should be given for the development and publication of papers similar to the classic researches of "Student" in England during the past few years.

THEODORE H. BROWN, *Chairman* JEAN F. CARROLL
DONALD R. BELCHER F. LESLIE HAYFORD

Report of the Committee on Census Enumeration Areas

The Committee on Census Enumeration Areas has aided those in large American cities to prepare maps dividing their cities into census tracts for the approval of the Geographer of the Bureau of the Census. The number of census-tract cities has been increased from 8 in 1910 and 16 in 1930 to 25 at present.

An all morning and luncheon meeting of the Committee was held on Wednesday, December 26. Representatives of all cities with a population of 250,000 or more were invited to this meeting for the purpose of discussing:

(1) The method of establishing census tracts in those large cities not yet laid out in this manner,
(2) The way data by census tracts have been used in census tract cities,
(3) The development of local data by census tracts, and
(4) The program of the Bureau of the Census regarding the simplification of the tables to be used in census tract cities in the next census.

This meeting was attended by 30 individuals. Five out of the six members of the Committee were present. The Bureau of the Census was represented by three persons, and 22 of the large cities were represented.

The manual of instructions compiled by the Chairman and Doctor Truesdell was discussed. The manual was prepared with the idea of helping those at present laying out cities by census tracts and those preparing street indexes by census tracts. The manual also serves to promote the use of census tracts in the local community. It shows how local data may be collected and analyzed, as well as how data collected in the regular decennial census may be used.

Of the 37 cities having a quarter of a million population or more, 21 have census tracts and 2 are in the process of preparing census tracts. Plans

were made by the Committee to interest individuals in the remaining 16 cities. While Cleveland was the only city having a street index by census tracts in 1927, as many as 9 cities now have similar volumes, and work is being undertaken in 3 other cities to prepare an index.

The Committee gave careful consideration to ways of simplifying the tabulation forms which the Bureau of the Census will use for analyzing the population and family data in the next census. The representatives of the various census-tract cities believe that tables should be included showing:

(1) Family heads by native white of native parentage; native white of foreign or mixed parentage; foreign-born white by country of birth; Negro; and other races,
(2) Rent and value or earned income, and
(3) Population by age, sex, and race, as indicated in Form C-1 shown in the manual.

The group also believes that illiteracy and marital condition should be tabulated and, if possible, industry by type and by sex.

Doctor Truesdell of the Bureau of the Census was requested to study these recommendations with a view to making suggestions as to the manner in which such tabulations could be obtained with a minimum amount of effort.

Noting with concern the growing need for accurate data relating to population and unemployment, and the importance of dependable data upon which to base rates in vital statistics, in social work and in commercial undertakings, the Committee on Census Enumeration Areas begs to propose the adoption of the following resolution:

> That the American Statistical Association reaffirm its action of 1932 and 1933 favoring a mid-decennial census of population at this time.

It is believed valuable to continue the activities of this Committee for the promotion of the census tract idea in both new census-tract cities and in those that have census tracts but have not taken full advantage of this "statistical tool."

HOWARD WHIPPLE GREEN, *Chairman*
ROBERT E. CHADDOCK
NEVA R. DEARDORFF
R. D. MCKENZIE
FREDERICK F. STEPHAN
EDWARD A. STEPHEN

Report of the Committee on Delinquents and Criminals

Last spring the Committee on Delinquents and Criminals took up with the Committee on Government Statistics the possibility of a cooperative study of federal criminal statistics. The Committee on Government Statistics and Information Service was willing to provide a small fund for this purpose. Mr. Morris Ploscowe was engaged to bring up-to-date the report he had prepared on the same topic for the Wickersham Commission and to

prepare a plan for the centralization of the statistics of federal criminal law enforcement. A joint conference of the two committees, with Mr. Ploscowe, was held in Washington in June. The final report was prepared, with some assistance from the chairman of this committee and members of the staff of the Committee on Government Statistics and Information Service.

This report dealt in its first part with the collection of the statistics of federal law enforcement and recommended that a central statistical service be set up in the Department of Justice, with the function of determining standards and procedure, collecting and analyzing the data compiled, and gradually drawing into the picture other governmental departments engaged in law enforcement and aiming to deal with all judicial statistics as soon as the time is ripe.

The work of the Federal Government in collecting national crime statistics was dealt with in the second part of the report and suggestions were made for the expansion and improvement of that work.

This report was presented to the Attorney-General of the United States on December 13, 1934, by a small committee with representatives from the Committee on Government Statistics and Information Service, and the Committee on Delinquents and Criminals of the American Statistical Association. Some of the recommendations, as they affect the Department of Justice, were put into effect even before the formal presentation of the report. A central statistical unit has been organized, headed by Mr. Bennet Mead, a member of the American Statistical Association Committee on Delinquents and Criminals, and plans for the systematic collection and analysis of federal judicial crime statistics are maturing.

THORSTEN SELLIN, *Chairman* — BENNET MEAD
C. E. GEHLKE — EDWIN H. SUTHERLAND
LEON C. MARSHALL — GEORGE B. VOLD

Report of the Committee on Statistics of Institutions for Physical and Mental Disorders

During the past year, the Committee on Statistics of Institutions for Physical and Mental Disorders held but two meetings.

Three major projects have engaged the attention of the committee during the year, namely:

(1) Cooperation with the United States Bureau of the Census in its effort to secure more prompt, complete, and accurate data on institutions for physical and mental disorders.
(2) The development of minimum standards of statistical reporting on general hospital services.
(3) Revision of statistical systems in use in institutions for mental disease, mental deficiency and epilepsy.

A special subcommittee was appointed by the chairman to deal with each of the first two projects. These committees have been continued for the coming year and it is expected that it will be possible to report more than mere progress at the next meeting of the Association.

With respect to the project of developing a plan for more prompt and efficient compilation of census data on institutional services, the committee holds that the procedure of the Census Bureau in gathering institutional statistics from individual institutions is unnecessarily time-wasting and otherwise unsatisfactory. It has therefore attempted to devise a plan which can be made uniform, legally or otherwise, in all states, through the cooperation of the committee with the Bureau of the Census, the American Public Welfare Association, the appropriate state administrative departments, and others concerned. In consideration of this matter the committee was favored with the counsel of Dr. Leon E. Truesdell, chief statistician for population of the Census Bureau.

Through the good offices of the National Committee for Mental Hygiene, your committee has obtained an abstract of the laws of the various states concerning the reporting and collection of institutional statistics. It is the purpose of your committee, if funds can be obtained for the purpose, to make a detailed analysis of this material and from it draft a program, legislative and administrative, which can as time goes on be undertaken by the various states. Uniform legislation on this subject would, your committee believes, do much to promote more efficient statistical work, both by the states and the Census Bureau.

In this connection, your committee believes that it would be highly desirable, particularly from the point of view of census reporting to establish a registration area for social welfare statistics. Once uniform legislation has been prepared and minimum requirements fixed, all states adopting such uniform legislation and the minimum standards of reporting procedure would become a part of the registration area. The setting up of such a registration area for social welfare statistics generally, would, it is believed, have the same effect on improving statistics in this field as has been observed in the field of vital statistics. Your committee offers this suggestion to the Association with the thought that its research committee may desire to take action on the matter in cooperation with the Bureau of the Census.

Your committee further proposes during the coming year to establish such contact with the American Public Welfare Association and the American Legislators Association as will aid in the development of uniform state laws concerning statistics. Each of these agencies is especially interested in the promotion of more efficient state and national administration, in which statistics plays so important a part. Your committee believes that it will be able to render a worthwhile service both to the cause of statistics and the cause of efficient government administration by encouraging the cooperation of these national agencies.

On the second project of your committee, namely, the development of uniform standards of general hospital reporting for the use of public as well

as private hospitals considerable progress was made during the year. Under the guidance of the research director of the Welfare Council of New York City uniform discharge schedules were received in 1933 from 105 general hospitals, the total schedules numbering 538,000. When the tabulation of the material is completed we shall be in a position to evaluate this system of securing data relative to general hospital patients. A similar experiment on a smaller scale is being conducted by the State Department of Social Welfare in cooperation with this committee and the committee on statistics of the American Hospital Association.

In connection with the third project of your committee, members of the committee cooperated with the Committee on Statistics of the American Psychiatric Association and the Committee on Statistics of the American Association on Mental Deficiency in the revision of classifications and the preparation of new statistical manuals relating to statistics of institutions for mental disease, mental deficiency and epilepsy. The revised systems as outlined in the new manuals were made effective in the institutions concerned on July 1, 1934.

Among the matters which have particularly interested this committee during the past year is a proposal to establish an Institute for Statistical Research, either independently or in connection with some already established agency for social or economic research. This project is one to which several members of the committee, particularly Mr. George W. Baehne, have given considerable time. It seems clear that such an institution, if adequately financed and efficiently administered, would contribute far more to the proper development of statistical procedure, and the interpretation and practical use of institution and welfare statistics than any other agency or service within our present view. Such an institute might well be developed as an adjunct of the American Statistical Association to serve both the needs of members of the Association as well as the needs of other voluntary associations in the many fields of public service. Your committee, therefore, recommends consideration of this matter by the Association and would welcome the views of all members interested.

A further problem to which your committee has given attention is that of making the JOURNAL more useful to the Association's membership and the general public. The field of social statistics is one which is now of major importance, and will become increasingly so with every advancement of government in the social welfare field. Statistics of social welfare services should, your committee believes, be utilized far more extensively and should be better interpreted as a means of public education and as an aid to public administration. In other words, an effort should be made by the Association to popularize social welfare statistics. To this end, your committee recommends that the JOURNAL undertake the development of a special department of social welfare statistics which shall be devoted to the publication of articles of general interest on the aims, purposes, and uses of statistics in this field. Your committee believes that material for such a department could be readily obtained from members of the Association engaged in social

research. Such department might well serve also as a clearing house of ideas and information for the special committees of the Association concerned.

Your committee again records its appreciation of the efficient work done by the Census Bureau in the field of institution statistics, and of the generous cooperation of the Bureau with statistical committees representing the several fields of welfare work.

G. W. Baehne
Frederick W. Brown
Kate H. Claghorn
Mary Augusta Clark
Emil Frankel
David M. Schneider
Carl E. McCombs, *Secretary*
Horatio M. Pollock, *Chairman*

Report of the Committee on Statistics of Relief and Child Care

During 1934 the Committee on the Statistics of Relief and Child Care concentrated its attention very largely upon activities for the development of better statistical information regarding children in foster care of various types. It reported at the last annual meeting that a brief monograph on the collection and tabulation of data in New York State had been submitted to the Department of Social Welfare of New York. This is regarded as an important element in the program of the Demonstration Project in the collection of social welfare statistics on which the State Department is now engaged. During the last year the Research Division of the Department has consulted with this Committee as to the installation of the system recommended, which, we are happy to report, will go into effect in large part on January 1 of the coming year. The material submitted by this Committee will be absorbed into a monograph and a manual which the New York State Demonstration Project expects to issue during the coming year.

While we cannot claim perfection for the report on the statistics of children in foster care, it was apparently of enough service to the Demonstration Project that its advisory committee turned to our Committee, as did the statistical committee of the Mothers' Aid Association to make a similar diagnosis of the statistics of mother's pensions. In response to the advisory committee's request, a subcommittee, with Maude E. Stearns as chairman, was appointed and has already begun its task.

Last year we reported the interest of the Committee in the development of an appraisal form similar to that for public health administration, by which a community can score its total resources and performance in the field of child care. Maurice J. Karpf has served as chairman of the subcommittee working on this project. This undertaking was of sufficient interest to the New York State Department of Social Welfare that it provided a very competent research worker for a period of about eight months, together with needed travel expense and clerical service. The Committee conceived the appraisal as covering the community's efforts to find and care for mentally defective children, to care for delinquent children and to care for dependent

and neglected children, now a very complex and often confused program. The literature on the subject was searched for material out of which to construct sound criteria and a tentative draft of the section of the appraisal form dealing with the care of mental defectives was first constructed. This was tried in two small cities in New York State and was found to give considerable promise that the enterprise as a whole had real merit and would, if successful, meet a need long recognized by persons interested in describing social welfare services and comparing communities for the adequacy of service and balance in their programs.

In July the State Department of Social Welfare found it impossible to continue the provision of staff service for the project, though the Department offered to assist with travel expense and clerical service if the project could be continued. Efforts to interest an appropriate foundation were not then successful. But your Committee expects to go on with the project if any feasible arrangement can possibly be made for staff service this year. It is the belief of the Committee that the present collection of data is in large measure justified only as it contributes to the development of standard descriptive processes and evaluation of programs and performances, and that as data are thus used the weaknesses in our present statistical analytical efforts are brought to light.

The Committee has viewed with interest the taking of the federal census of children in the care of agencies on December 31, 1933 by the U. S. Census Bureau and has reviewed a piece of work done by a member of this Committee in checking the accuracy of that census. As assistant commissioner of the New York State Department of Social Welfare and director of its Research Division, David M. Schneider was able to check the data submitted in the census with identical items on file with the Department about each of the 50,000 children in care at the end of the year and with data on the operations of the agencies which had a total of 78,000 different children in care during the year. Where discrepancies appeared there was a check with the agency making the return. A record was kept of inaccuracies in the various kind of data submitted. The Committee, in a meeting on December 26, voted to request the publication of Dr. Schneider's report in the Journal of this society.

Thus far we have reported projects that fall within the field of child care. The Committee report last year promised to make an attack on some of the questions that beset the field of relief statistics. We must here report that we did not get to that job. The demands of projects already undertaken and the absorption of many of the members in emergency services prevented our going into these questions with the thoroughness and care required to render a real service.

In reflecting on this matter, the Committee at its recent meeting came to the conclusion that it should report to the society that with relief statistics assuming the importance and complexity that they have at this time, it would be wise for the society to set up a separate committee on relief statis-

tics, broadly construed to include data on old age pensions, veterans' relief, work relief and similar matters. Our Committee will go ahead with the mothers' aid project but will be glad to turn over the results to any new committee that is created. Our Committee thought that in establishing a new committee the society should give thought to the need for a modest fund required for the occasional meeting of its members who should come from more than one or two communities.

Our own Committee asks to be continued so that we may push further into the matter of getting proper statistical data in the field of child care in its manifestations other than aid to families in their own homes.

NEVA R. DEARDORFF, *Chairman*
F. STUART CHAPIN
EWAN CLAGUE
EMIL FRANKEL
RALPH HURLIN
MAURICE J. KARPF
PHILIP KLEIN
DAVID M. SCHNEIDER
MAUDE E. STEARNS
FREDERICK F. STEPHAN
EMMA WINSLOW
HELEN WITMER

Report of the Committee to Inquire into the Question of Calendar Reform

At its meeting in December 1933, the Association requested the present Committee:

1. To prepare a list of types of organizations whose operations are likely to be materially facilitated or hindered by changes in the existing calendar.
2. To prepare a statement showing the nature of the leading types of calendar reform considered by the Committee and the comparative merits and demerits of each of these types of calendar reform.
3. To draft a questionnaire suitable for presentation to organizations of the types mentioned under (1), the purpose of this questionnaire being to ascertain whether or not the operations of the organization would be facilitated by the adoption of any of the types of calendar reform listed by the Committee; and which of these types would be most desirable from the standpoint of the organization in question.
4. To send information similar to that mentioned above to the members of the American Statistical Association and to inquire from each member concerning his preference as regards calendar reform, and his opinion as to which of the proposed types of calendar reform—if any—would most facilitate the operation of the organization or institution with which he is connected.

The Committee had to decide at its first meeting which of the instructions of the Association could be successfully followed within the limits of the Committee's time and abilities. It was decided that the Committee could function most profitably if it began with the last of the instructions. In the

process of ascertaining the opinion of the Association's membership concerning the problem of calendar reform, it could help to formulate effectively the advantages and disadvantages of the leading plans of calendar reform; it could take the first step towards ascertaining the types of organization whose operations would be facilitated or hindered by changes in the present calendar; and the questionnaires sent out to the members of the Association could serve as models, subject to possible necessary revision, for any questionnaires to be sent to the organizations whose operations might be affected by calendar reform.

To circularize the membership of the American Statistical Association was an undertaking that required some funds. The Committee was fortunate in receiving a grant of $250 each from the World Calendar Association and the International Fixed Calendar League. To these two leading organizations in the field of calendar reform the Committee is indebted not only for financial assistance in its work, but also for helpful interest and considerable assistance in solving some difficulties of formulation and analysis.

The Committee considered it best to make the first questionnaire sent to the membership of the Association largely informative and general. This questionnaire was to indicate to the members the defects of the present calendar, and to ascertain their general attitude to the advisability of calendar reform as well as their interest in the whole problem. This first questionnaire, sent out in May, was followed by a second one mailed in November only to those members of the Association who have expressed interest in the problem and their willingness to answer a second, more detailed inquiry. The results of both questionnaires are presented fully in an appendix to this report.[1] However, a brief summary of the results may be presented in this report.

1. Judging by the fact that the first questionnaire was answered by 21 per cent of the Association's membership, only a minority of the members of the Association are sufficiently interested in or aware of the problems offered by the present calendar. But among this minority are most of the prominent members of the profession.
2. Of the minority of the membership who were sufficiently interested in calendar reform to answer the first questionnaire, the overwhelming majority was favorably inclined to calendar reform and was willing to urge a reform of the calendar within the near future.
3. In some fields of interest there was, however, a negative attitude to a change in calendar. This was true of such fields as insurance, and was shown by those members of the Association who are interested primarily in the mathematical theory of statistics.
4. Judging by the second questionnaire, only about 10 per cent of the Association's membership are sufficiently conversant with, and interested in, the calendar problem to pass detailed judgment upon its various aspects. However, the replies of this small minority throw considerable

[1] To be published in a later issue of the JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION.

light upon various questions connected with the change of the calendar.

5. From the viewpoints of the field of special interest and/or of statistical practice as a whole, the gravest disadvantages of the present calendar are the unequal number of days in the months and the fact that in successive years one and the same month has a varying number of different days of the week. Accordingly, from the same viewpoints, the gravest disadvantage of any change in the calendar is the changing length of the months from the old to the new calendar. But from the viewpoint of society as a whole, the most important defect of the present calendar is the shift in holidays from year to year, and other shifts of dates; while the greatest disadvantage of a change in the calendar is the disappearance in the new calendar of certain dates existing in the old calendar.
6. The replies in the second questionnaire are overwhelmingly in favor of a reform of the present calendar. As between the two leading plans of reform, the 12 months equal quarters plan, and the 13 equal months plan, the former is slightly favored over the latter in replies given from the viewpoints of special field of interest and/or statistical practice as a whole. From the viewpoint of society as a whole, there is a marked preponderance in favor of the 12 months equal quarters plan, 92 out of 147 replies giving a definite choice favoring this plan.

As may be seen from the above account, the Committee has not succeeded in carrying through all the assignments suggested at the meeting of the Association in December 1933. It is hoped, however, that the work done by the present Committee in ascertaining the attitude of the Association's membership to calendar reform will facilitate any attempts that the Association may make toward further progress in this field.

SIMON KUZNETS, *Chairman*
J. V. DE PORTE
M. B. FOLSOM
J. F. HELLWEG
ARYNESS JOY
CHAS. F. MARVIN
ALEXIS SOMMARIPA
H. PARKER WILLIS
P. W. WILSON

Report of the Members of the Social Science Research Council

In the year ended September 1934, the Social Science Research Council engaged in undertakings novel to it, with the purpose of rendering what direct service to the country in a prolonged period of depression lay within its capacity.

Early in 1933 the Council's staff had been in consultation with officers of the Rockefeller Foundation with reference to the formulation of a program of emergency work designed to be of utility to Government. Many parts of the Council organization ultimately shared in the preparation of proposals of this emergency character. In certain cases and in very varying degree,

the Council has participated in studies desired by agencies of Government. In several instances the Council has served simply as a disbursing agent for such enterprises. For two very important inquiries, the Council has undertaken direct responsibility. These are studies of government statistics and information services and of population redistribution.

A committee on government statistics and information services was established in June 1933, jointly by the American Statistical Association and the Social Science Research Council. The committee was financed for one year and located in Washington where most of its members were in residence during the year. In addition to full-time service by resident committee members, an exceptionally adequate staff was provided. The committee has been very actively at work throughout the year 1933–34 in studying the needs of statistical and other informational services in the national government. Its advice has often been sought by officials and has clearly been valued. Numerous memoranda on particular services prepared by the committee are available in mimeographed form. A general report will be issued in 1935.

In response to the desires of a number of officials for assistance on problems arising out of the movement of people, the Council secured financial support for a year's study of the redistribution of population. Funds for the study were appropriated to the University of Pennsylvania and placed under the personal administration of the dean of the Wharton School of Finance and Commerce, supported by an advisory committee named by the Council. A staff was organized with offices in Washington, where work has been under way since May 1934. The project was conceived as a series of service studies dealing with such matters as subsistence communities and relocation of industry, of immediate utility to various branches of the national government. It remains such in large measure, but more attention than anticipated has been given to matters related to longer term population policies.

Beyond the preparation of materials for the use of policy and action determining agencies of government, the Council took a further step in its endeavors to be of direct public service, in appointing two commissions of inquiry. One commission has been created on national policy in international economic relations; one has been created on public service personnel. Both undertakings were approved at their beginning by the President of the United States and members of his Cabinet. Both commenced work in January 1934. These commissions represent an attempt by the Council to contribute directly to clarity of thinking on important public issues. Acceptance or rejection of any conclusions at which these commissions may themselves arrive on questions of public policy is a matter of relative indifference. It is hoped that their analysis of issues will contribute to the organization of intelligent public opinion. Members of the commissions were selected solely on the basis of their capacity for impartial, objective thought, without any effort to represent viewpoints, interests, or groups. The commissions will endeavor to secure the best technical advice and also through public hearings at various

points in the country to take cognizance of substantial bodies of current opinion.

The Council took the initiative in setting up these two commissions, named their members, provided their mandates, secured and appropriated to them the necessary funds; and then made them completely autonomous bodies with responsibility solely to the public.

While pursuing these novel lines of effort during the year, the Council has been no less active on its normal program.

The Council maintained eighteen post-doctoral fellowships for the academic year 1933–34 with stipends totaling $58,521.45 and made sixteen new awards for 1934–35 with stipends totaling $57,050.00. The 1933–34 appointments, of which two were re-appointments, were all for a period of one year. The 1934–35 appointments included twelve new awards for a period of one year, two new awards for a period of two years, and two renewals of 1933–34 awards for an additional period of one year. A grant of $75,000 was secured for similar awards in 1935–36.

A grant of $100,000 was secured for awards in 1935–36 for pre-doctoral fellowships in accordance with plans previously reported for giving to selected students a year of experiential training after completion of course requirements for the doctorate, and for giving experimentally to very exceptional candidates a few fellowships on entrance to graduate study.

The Council had at its disposition grants of funds enabling it to maintain forty-three grants-in-aid for the year, in the amount of $18,995.00, and to make forty-six new awards for 1934–35, totaling $22,293.92.

In the area of industry and trade, plans for a general inquiry on banking policy and credit control were furthered by provision for a study of the financial of real property, following upon completion of the initial inquiry on durable goods and capital formation. Both of these studies were undertaken by the National Bureau of Economic Research. A project for the experimental development of occupational specifications as a basis for the operation of public employment exchanges was merged with proposals from other sources and incorporated in a study under government auspices. In the area of personality and culture, several conferences of specialists were held to assist the committee in completing its analysis of the field in terms of central problems and of general procedure. The committee on pressure groups and propaganda also finished its task of presenting its field in a coherent form and formulated specific reasearch proposals.

Under the joint auspices of the committees on public administration and on industry and trade, and with staff assistance, preliminary work was done on a general plan for research on social insurance and relief problems. This undertaking proved useful in clarifying the relations, on the one hand between insurance and relief, and on the other, between the various social insurances. The results of this preliminary work were made available to the officials concerned on establishment by the national government of its committee on economic security.

The joint committee with the American Council of Learned Societies on materials for research undertook active promotion of library inventory and archival survey projects under federal relief funds. The preparation of a handbook on collecting, selecting, and organizing ephemera, was commenced under a Council appropriation. Progress was made on experimental provision by the committee of a publishing service for research materials, and constant stimulation was given by the committee to the technical perfecting of various methods of reproduction of materials.

EDGAR SYDENSTRICKER, *Chairman* SEYMOUR L. ANDREW
WILLIAM A. BERRIDGE

Report of the Representative on the Board of Directors of the National Bureau of Economic Research

With the current year, the National Bureau of Economic Research concludes its fifteenth year of existence and, incidentally, the fifteenth year of service of your present representative on its Board of Directors.

During the year, the Bureau has moved to new and improved quarters at 1819 Broadway, New York City, and has substantially enlarged the scope of its activities. It enters on the fourth quinquennial of its life with an established and unique national and international position as the leading source in the United States for impartially and scientifically compiled economic statistics.

The published volumes of the Bureau now number twenty-six and constitute a most comprehensive reference series for the statistician and economist. Additions to this series during the present year have been of special importance, and have included: *Production Trends in the United States Since 1870,* by Arthur F. Burns; *Strategic Factors in Business Cycles,* by John Maurice Clark; *German Business Cycles,* by Carl T. Schmidt; and *Industrial Profits in the United States,* by Ralph C. Epstein. It is also probable that Dr. Jerome's *Mechanization in Industry* will appear before the end of the year. In addition, a report on Profits by Prof. Paton has been approved for publication and should issue at an early date. The Bulletins of the Bureau have, furthermore, been placed on a systematic schedule and have been enlarged to permit advance publication of extensive abstracts of many of the Bureau's studies.

The work of the Bureau during the past year has included new statistical material in the form of estimates of the national income for the years of 1929 to 1932, inclusive, figures on capital formation by Dr. Kuznets in Bulletin 52, and compilations of business profits in Dr. Epstein's volume. Early investigations will also include a study of real estate finance and economic stability, which is to be undertaken in cooperation with a special committee on credit and banking of the Social Science Research Council.

As in previous years, your representative, with other directors, has contributed to the publications of the Bureau through a critical reading and annotation of advance copies of the various texts.

M. C. RORTY

Report of the Representative on the Business Research Council

For the past two years the Business Research Council has been inactive except for such meetings as are necessary to maintain its corporate existence. With a view to possible future usefulness, the Board of Directors feel that the Council should be continued in substantially its present form. Since I am serving as Secretary-Treasurer of the Council, I suggest that, subject to the approval of the Association, my appointment as representative on the Council be extended for the year 1935.

DONALD R. BELCHER

Report of the Representative on the Joint Committee for the Development of Statistical Applications in Engineering and Manufacturing

During the year, active cooperation with the corresponding English and German committees has been continued. Our committee has continued to serve as a clearing house of information for American engineers and manufacturers interested in the application of statistical methods to their problems and has cooperated with the Management Division of The American Society of Mechanical Engineers in bringing such applications to the attention of their management engineers. This has resulted in their setting up a subcommittee in that society to consider the special applications to the control of quality of manufactured product. The increase in interest in the application of statistical method on the part of engineers during 1934 as indicated by the requests coming to our committee far exceeded similar increases in any other year since the committee was formed in 1929.

W. A. SHEWHART

Report of the Representative on the National Conference on Nomenclature of Disease

Following the preliminary edition of the *Standard Classified Nomenclature of Disease* in April 1932, the first official edition was published in January 1933. This edition has now been in use for substantially two years by a large and growing number of hospitals. As the *Nomenclature* has come into more general use, and as physicians have become more familiar with it, the office of the National Conference has received a great many criticisms and suggestions from medical men representing practically all the medical special-

ties. These criticisms and suggestions have been laid before Advisory Committees in the different specialties. The result has been that necessary changes have been made in the *Nomenclature* and certain sections of it have been rewritten. This is inevitable; for it is not humanly possible to perfect a work of this kind except on the basis of its actual use in hospitals. It has now become necessary to publish a second official edition. This, it is hoped, will meet the situation for at least two or three years longer, by which time it is probable that still more constructive suggestions and criticisms will have been received which may again indicate the necessity for still another revision of the *Nomenclature*. The task has been a gigantic one and it is evident that it is still unfinished.

There are now upwards of 120 hospitals in which the *Nomenclature* is being satisfactorily used. There are approximately 300 other hospitals which have secured copies, but which have not advised the National Conference as to how fully their institutions are making use of the *Nomenclature*.

During the year, many notable additions to the list of hospitals using the *Nomenclature* have been made. Among these are: Lenox Hill Hospital, New York; Wisconsin General Hospital; Montreal General Hospital; Bell Memorial Hospital, Kansas City; Baltimore City Hospitals; Jefferson Medical College Hospitals; Rhode Island Hospital, Providence; Jewish Hospital, Philadelphia; Duke University Hospital; Mount Sinai Hospital, Cleveland; and Bellevue Hospital, New York. The installation at Bellevue has not yet been completed. It is probable that the *Nomenclature* will soon be installed in the Toronto General Hospital.

We can now say that the *Standard Nomenclature* is in use in most of the important hospitals of the country, the notable exceptions being Massachusetts General, Boston City, and Johns Hopkins. Practically all of the well known medical schools in the United States and Canada have the *Nomenclature* in at least some of their hospitals. Johns Hopkins and the University of Michigan are exceptions.

The National Conference has learned by experience that uniformity of diagnostic records in different hospitals can be maintained only through a central guiding organization. It is the firm belief of the National Conference that it must continue to have a central office for an indefinite time, although it is hoped that as more and more hospitals become familiar with the *Nomenclature* and its use, less guidance will be required. It is the hope of the National Conference that through the extensive use of the *Standard Nomenclature* it will become possible fairly soon to consolidate the morbidity statistics of these institutions on a large scale and in the most exact terms which medical science can supply.

I wish to advise the American Statistical Association that I have served not only as its representative, but as a member of the Executive Committee of the National Conference on Nomenclature of Disease. It is my judgment that the American Statistical Association should continue to be represented.

GEORGE H. VAN BUREN

Report of Representatives on the Joint Committee on the Encyclopedia of the Social Sciences

The following statements prepared by Professor Edwin R. A. Seligman constitute the report of the representatives of the American Statistical Association on the Joint Committee on the Encyclopedia of the Social Sciences:

November 23, 1934.

Volume XIV of the Encyclopedia of the Social Sciences will appear in a few days, and volume XV is expected to be published by Christmas, thus completing the great enterprise in which we have all been engaged for over seven years.

We have kept to our promise of having three volumes appear a year, but this, together with all sorts of unforeseen complications, and with the determination at all costs to render a first class performance, has resulted in far greater expenditure than was anticipated. My original estimate was six hundred twenty-five thousand dollars; the final cost will be over double that amount—somewhat more than one and one-quarter million dollars.

The completion of the enterprise would not have been possible without the generous aid of the Rockefeller and the Carnegie Foundations, the help of the publishers, and the great sacrifices of both time and money on the part of the editorial staff. Now that the enterprise is concluded, it is up to our Advisory Editors and Members of the Joint Committee to do their share. Every one of the ten sponsoring societies ought to help. This help can take a double form: in the first place, there ought to appear, as soon as possible, in each of the scientific journals of the respective associations, an adequate review of the enterprise as a whole; secondly, each of the sponsoring associations ought to endeavor—by appropriate means, such as appeals, printed reminders, etc.—to secure as subscribers such of its members as have not yet subscribed; and should make an effort to obtain some local donors who would see to it that the Encyclopedia find a home in the smaller colleges and local libraries.

We started out with some five thousand subscribers, who have been cut down by the depression to about four thousand. The Encyclopedia ought to have a far more widespread distribution and I appeal to you, as a representative of the sponsoring association, to make a serious effort to achieve this end. I endeavored hitherto to impose as little as possible on your time and good nature, but I trust that you will now lend a helping hand in making the Encyclopedia known to a much wider circle. The editors have done their best; the further responsibility for the success of our joint enterprise now rests upon you and your colleagues. May I not hope that you will do your share.

December 17, 1934.

In the circular letter which I sent you on the 23rd of November I stated that Volume XV was expected to be published by Christmas. The volume proper is now all complete, but unfortunately the preparation of the very detailed index will necessitate the postponement of the final volume until about February.

For the purposes of the annual report to the Association, it might be of interest to present the following figures: The total cost of the enterprise, which was originally estimated at $625,000, is slightly over one and a quarter millions. The funds have been derived from the Rockefeller Foundation, the Carnegie Corporation, the Russell Sage Foundation, and private subscriptions. The largest contributions have been about $625,000 from the Rockefeller Foundation and $275,000 from the Carnegie Corporation.

Royalties during the appearance of the Encyclopedia went to the En-

cyclopedia itself to help defray expenses. After the completion of the Encyclopedia the royalties are to go to the Social Research Council, except that, before any royalties accrue to the Social Research Council, the publisher must be paid back from royalty earnings the sum of approximately $40,000, which they have advanced to insure the completion of the Encyclopedia. As a consequence, the number of subscribers will have to be almost doubled before the publisher is reimbursed for this outlay. It is from this end that we are appealing to the Constituent Societies for help.

ROBERT H. COATS
MARY VAN KLEECK

Other Committees and Representatives

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Meredith B. Givens

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John R. Riggleman, *Chairman*

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Wesley C. Mitchell

REPRESENTATIVE ON THE ADVISORY BOARD OF THE AMERICAN YEARBOOK
Samuel A. Stouffer

REPRESENTATIVE ON THE COUNCIL OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
William F. Ogburn

REPRESENTATIVES ON THE COMMITTEE TO ADVISE THE NEW YORK STATE DEPARTMENT OF WELFARE
Ralph G. Hurlin — Horatio M. Pollock

PROGRAM

OF THE

NINETY-SIXTH ANNUAL MEETING

AMERICAN STATISTICAL ASSOCIATION

PALMER HOUSE, CHICAGO, ILLINOIS

WEDNESDAY, DECEMBER 26, 1934

12:30 P. M.—(Luncheon) COMMITTEE ON CENSUS ENUMERATION AREAS

Chairman: Howard W. Green, Cleveland Health Council

1:00 P. M.—SOCIAL STATISTICS IN THE RESEARCH PROGRAM OF THE FEDERAL EMERGENCY RELIEF ADMINISTRATION

(Joint Meeting with the American Sociological Society)

Chairman: Dorothy S. Thomas, Yale University

The General Development and Present Status of the FERA Research Program
Howard B. Myers, Assistant Director, Division of Research, Statistics and Finance, FERA

The Contribution of Rural Research to Rural Relief Problems
Dwight Sanderson, Coordinator of Rural Research, FERA

State and Local Statistical Studies Conducted as Work Relief Projects
Frederick F. Stephan, Coordinator of Statistical Projects, FERA

From Description to Research
Clark Tibbitts, Coordinator of Urban Research, FERA

Discussion: William F. Ogburn, University of Chicago; Stuart A. Queen, Washington University; and George Lundberg, Bennington College

2:30 P. M.—I. NATURE AND ATTRIBUTES OF THE CURRENT BUSINESS CYCLE

Chairman: Bradford B. Smith, Cleveland Trust Company

Some Disillusionments on the Business Cycle
Lionel D. Edie, Edie-Davidson, Inc., New York City

A Theorist's Comment on the Current Business Cycle (167)
Joseph Schumpeter, Harvard University

Discussion: Frank R. Garfield, Federal Reserve Board; Willard Thorp, Consumers Division, National Emergency Council; and Arthur Marget, University of Minnesota

Numbers in parentheses refer to pages in this Supplement on which papers or abstracts of papers are published.

2:30 P. M.—II. STATISTICAL SOUNDINGS ON THE NATURE-NURTURE PROBLEM

Chairman: John Anderson, University of Minnesota

A Study of Twins as a Method of Investigating Nature and Nurture (269)
Frank N. Freeman, University of Chicago

The Statistical Evaluation of Nature and Nurture (274)
Karl J. Holzinger, University of Chicago

A Study of Adopted Children as a Method of Investigating Nature and Nurture (281)
Alice M. Leahy, University of Minnesota

Discussion: C. H. McClory, State University of Iowa; George W. Snedecor, Iowa State College; and Beth L. Wellman, State University of Iowa

8:00 P. M.—RECENT ECONOMIC, SOCIAL, AND POLITICAL CHANGES
(Joint Meeting with American Economic Association, American Sociological Society and American Political Science Association)

Chairman: Edwin R. Embree, Rosenwald Fund, Chicago

The Paths of Economic Change: Contrasting Tendencies in the Modern World
Calvin Hoover, Duke University

Man and His Changing Institutions
William F. Ogburn, University of Chicago

Post-War Changes in the Structure and Functioning of Government, and Some of their Economic and Social Consequences
C. E. Merriam, University of Chicago

THURSDAY, DECEMBER 27, 1934

9:00 A. M.—BUSINESS MEETING

10:00 A. M.—I. BUSINESS ENTERPRISE AND THE ORGANIZATION OF PRODUCTION
(Joint Meeting with American Economic Association)

Chairman: R. E. Heilman, Northwestern University

Business Enterprise: Its Present Status, Functions and Limitations, and Tendencies Shaping Its Development
George Soule, The New Republic

Changes in the Character, Structure, and Conditions of Production
H. S. Person, Taylor Society

Discussion: Sumner H. Slichter, Harvard University; S. M. DuBrul, General Motors Corporation; and S. Howard Patterson, University of Pennsylvania

Numbers in parentheses refer to pages in this Supplement on which papers or abstracts of papers are published.

10:00 A. M.—II. SPENDING: ITS ECONOMIC EFFECTS AND FISCAL CONSEQUENCES
(Joint Meeting with American Economic Association)

Chairman: Horace Secrist, Northwestern University

Public and Private Spending, and the Problem of Maintaining Purchasing Power
J. M. Clark, Columbia University

The Federal Budget and Its Consequences Fiscally Considered
Fred R. Fairchild, Yale University

The Federal Finances and the Banking System (169)
James W. Angell, Columbia University

Discussion: Tipton R. Snavely, University of Virginia; Ray B. Westerfield, Yale University; and Harley L. Lutz, Princeton University

10:00 A. M.—III. STATISTICS IN PUBLIC HEALTH AND MEDICINE

Chairman: Frank W. Notestein, The Milbank Memorial Fund

Application of Punched Card Methods to Hospital Statistics (244)
Halbert L. Dunn and Leonard Townsend, University of Minnesota

The Error of the Erythrocyte Count as Estimated with the Hemacytometer[1]
Joseph Berkson, Mayo Clinic

A Method of Analysis of Malaria Field Data (249)
H. H. Howard, W. C. Earle, and Hugo Muench, Rockefeller Foundation

Discussion: Carroll E. Palmer, Johns Hopkins University; G. E. Harmon, Board of Health, Chicago; and Douglas V. Brown, Harvard University Medical School

10:00 A. M.—IV. OUTLOOK FOR INDUSTRY UNDER THE NEW DEAL

Chairman: Leonard P. Ayres, Vice-President, Cleveland Trust Company

The Steel Industry under the New Deal
Ralph J. Watkins, University of Pittsburgh

The Economics of the Industrial Recovery Program
Neil Carothers, Lehigh University

Discussion: Russell Weisman, Western Reserve University and John W. Love, Business Writer, Cleveland Press

12:00 M.—(Luncheon) CHANGES IN WORKING HOURS AND WAGE RATES DURING RECOVERY, AND THEIR ECONOMIC CONSEQUENCES

Chairman: Leo Wolman, Columbia University

Speakers:

Isador Lubin, U. S. Commissioner of Labor Statistics

T. O. Yntema, University of Chicago (203)

Jacob Perlman, U. S. Bureau of Labor Statistics

[1] Revision to be published in a forthcoming issue of the JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION.

Numbers in parentheses refer to pages in this Supplement on which papers or abstracts of papers are published.

2:30 P. M.—I. THE UNITED STATES IN A WORLD ECONOMY

(Joint Meeting with American Economic Association)

Chairman: Ernest L. Bogart, University of Illinois

International Aspects of Problems of Production and Trade
Melchior Palyi, University of Chicago

International Movements of Capital
Arthur Feiler, New School for Social Research

Discussion: Simon Litman, University of Illinois and Ralph E. Freeman, Massachusetts Institute of Technology

2:30 P. M.—II. INDUSTRIAL CHANGE AND UNEMPLOYMENT

(Joint Meeting with American Association for Labor Legislation)

Chairman: William F. Ogburn, University of Chicago

The Problem of Unemployment and the Changing Structure of Industry (209)
Ewan Clague, Pennsylvania School of Social Work

The Government and Unemployment
Edwin E. Witte, University of Wisconsin

Discussion: George Soule, The New Republic; Harry Jerome, University of Wisconsin; and Paul A. Raushenbush, Wisconsin Industrial Commission

2:30 P. M.—III. STATISTICAL TECHNIQUE

Chairman: W. A. Shewhart, Bell Telephone Laboratories

A Critical Review of Recent Progress in Statistical Methodology[3]
Paul R. Rider, Washington University

Suggested Problems for Mathematical Research (257)
Burton H. Camp, Wesleyan University

The Sampling Theory of Several Variables
S. S. Wilks, Princeton University

Analysis of Covariance of Statistically Controlled Grades (263)
George W. Snedecor, Iowa State College

Discussion: Allen T. Craig, State University of Iowa; C. C. Craig, University of Michigan; Bruce D. Mudgett, University of Minnesota; and Walter A. Hendricks, U. S. Department of Agriculture

[3] Published in the JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION, March, 1935, Vol. XXX, p. 58.

Numbers in parentheses refer to pages in this Supplement on which papers or abstracts of papers are published.

2:30 P. M.—IV. MONETARY POLICY AND PRICE CHANGES DURING RECOVERY: A SURVEY OF RELEVANT EVIDENCE

(Joint Meeting with Econometric Society)

Chairman: Irving Fisher, Yale University

Recent Monetary Experiments and their Effect upon the Theory of Money and Prices[3]
Willford I. King, New York University

Recent Movements in International Price Levels and the Doctrine of Purchasing Power Parity (159)
Frank D. Graham, Princeton University

Price Inflexibility and the Requirements of a Stabilizing Monetary Policy[4]
Gardiner C. Means, U. S. Department of Agriculture

Discussion: George F. Warren, Cornell University; Harry Gideonse, University of Chicago; and Charles F. Roos, Colorado College

8:00 P. M.—PRESIDENTIAL SESSION

(Joint Meeting with American Economic Association and American Association for Labor Legislation)

Presiding Officer: Walter Dill Scott, President, Northwestern University

The Union in Industry; Some Aspects of Collective Bargaining
Harry A. Millis, President, American Economic Association

Statistics and Leviathan[4]
Frederick C. Mills, President, American Statistical Association

The Economics of Labor Legislation
Leo Wolman, President, American Association for Labor Legislation

FRIDAY, DECEMBER 28, 1934

9:00 A. M.—BUSINESS MEETING

10:00 A. M.—I. PROBLEMS OF ECONOMIC SECURITY AND SOCIAL INSURANCE

(Joint Meeting with American Sociological Society and American Association for Labor Legislation)

Chairman: Dorothy S. Thomas, Yale University

Functions of Social Insurance in Relation to Economic Security
R. Clyde White, University of Indiana

Social and Economic Aspects of the Problem of Insecurity in Modern Life (215)
Paul Douglas, University of Chicago

Economic and Administrative Criteria for a Social Insurance Program
Elizabeth Brandeis, University of Wisconsin

Discussion: Phillip Klein, New York School of Social Work, and Spencer Miller, Jr., Secretary, Workers Education Bureau of America

[3] Revision to be published in a forthcoming issue of the JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION.
[4] Published in the JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION, March, 1935, Vol. XXX, p. 1.

Numbers in parentheses refer to pages in this Supplement on which papers or abstracts of papers are published.

10:00 A. M.—II. STATISTICS IN MANAGEMENT AND PRODUCTION CONTROL

Chairman: Donald R. Belcher, American Telephone and Telegraph Company

The Use of Statistics in Quality Control: An Appraisal of Past Experience and Future Possibilities
Walter A. Shewhart, Bell Telephone Laboratories

Statistics and Statistical Method in Determining Business Policy
William J. Donald, National Electric Manufacturers Association

The Use of Statistics in the Study of Consumer Demand (183)
Henry G. Weaver, General Motors Corporation

Discussion: W. N. Mitchell, University of Chicago; Theodore H. Brown, Harvard University; Paul H. Nystrom, Columbia University; and Paul R. Rider, Washington University

10:00 A. M.—III. CHANGES IN THE AGGREGATE VOLUME AND DISTRIBUTION OF PURCHASING POWER DURING RECOVERY

(Joint Meeting with American Farm Economic Association)

Chairman: Joseph S. Davis, Food Research Institute, Stanford University

Agricultural Income and Purchasing Power
O. C. Stine, Bureau of Agricultural Economics

Labor Income and Purchasing Power
Aryness Joy, Statistician, National Emergency Council

Property and Entrepreneurial Income and Purchasing Power
Ralph Epstein, University of Buffalo

Discussion: Lewis L. Lorwin, The Brookings Institution, and Louis H. Bean, Agricultural Adjustment Administration

10:00 A. M.—IV. WALRAS CENTENNIAL PROGRAM

(Joint Meeting with Econometric Society and American Economic Association)

Chairman: Joseph Schumpeter, Harvard University

Letters and Unpublished Papers of Leon Walras
William Jaffe, Northwestern University

The Monetary Aspects of the Walrasian System
Arthur Marget, University of Minnesota

Discussion: Oskar Lange, Rockefeller Foundation, and Irving Fisher, Yale University

12:00 M.—(Luncheon) NEW DEAL STATISTICS

Chairman: Stuart A. Rice, U. S. Bureau of the Census

European Experiences and New Deal Statistics (227)
Karl Pribram, Brookings Institution

New Deal Statistics
Winfield Riefler, Economic Advisor, The Executive Council, Washington

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2:30 P. M.—I. INVESTMENT BANKING AND THE SECURITIES MARKETS

(Joint Meeting with American Economic Association)

Chairman: W. Randolph Burgess, Federal Reserve Bank of New York

Security Regulation and Speculation
Rufus Tucker, Twentieth Century Fund

The Use of Credit in Securities Markets
Woodlief Thomas, Federal Reserve Board

Discussion: George Mathews, Securities and Exchange Commission; Dean Langmuir, Investment Counsel, New York; and George W. Edwards, College of the City of New York

2:30 P. M.—II. THE NATIONAL INCOME

(Joint Meeting with American Economic Association)

Chairman: Willford I. King, New York University

The National Income and Its Distribution[5]
W. L. Crum, Harvard University

How the National Income Was Spent 1919–1929 (175)
Clark A. Warburton, Federal Deposit Insurance Corporation

Social and Economic Implications[6]
Morris Copeland, Central Statistical Board

Discussion: Ralph C. Epstein, University of Buffalo, and H. L. McCracken, Louisiana State University

2:30 P. M.—III. SOCIAL INSURANCE: A SURVEY OF STATISTICAL REQUIREMENTS AND EXISTING STATISTICAL RESOURCES

(Joint Meeting with American Association for Labor Legislation)

Chairman: Isador Lubin, U. S. Commissioner of Labor Statistics

Unemployment Statistics and Unemployment Insurance Administration
A. J. Altmeyer, Second Assistant Secretary of Labor

Statistics in Social Insurance (221)
C. A. Kulp, University of Pennsylvania

Discussion: I. M. Rubinow, Secretary, B'nai B'rith

6:00 P. M.—(Dinner Meeting) PROBLEMS OF RECOVERY

Chairman: Willford I. King, New York University

Speakers:

Leonard P. Ayres, Cleveland Trust Company (143)

Henry A. Wallace, Secretary of Agriculture (150)

John Dickinson, Assistant Secretary of Commerce (155)

[5] Published in the JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION, March, 1935, Vol. XXX, p. 35.

[6] Revision to be published in a forthcoming issue of the JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION.

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SATURDAY, DECEMBER 29, 1934

9:00 A. M.—BUSINESS MEETING

10:00 A. M.—THE RELATION BETWEEN FEDERAL AND STATE AGENCIES IN THE COLLECTION OF STATISTICAL INFORMATION

Chairman: M. R. Benedict, University of California

Progress in Coordination of State and Federal Collection of Labor Statistics (233)
Sidney W. Wilcox, U. S. Bureau of Labor Statistics

A Plan for the Coordination of State and Federal Activities in the Collection of Agricultural Statistics (237)
H. R. Tolley, Director, Giannini Foundation of Agricultural Economics, University of California, and O. V. Wells, Program Planning Division, Agricultural Adjustment Administration

10:00 A. M.—I. THE HOUSING PROBLEM AND A HOUSING PROGRAM

Chairman: Alfred K. Stern, Julius Rosenwald Fund, Chicago

Housing Conditions in America (288)
Nathanael H. Engle, Assistant Director, Bureau of Foreign and Domestic Commerce

Real Estate Values, Housing Costs, and the Volume of Construction (301)
Roy Wenzlick, The Real Estate Analyst, St. Louis

The Financial Survey for Urban Housing (295)
David L. Wickens, Bureau of Foreign and Domestic Commerce

The Housing Program of the Federal Government: Its Accomplishments and Prospects (303)
Ernest M. Fisher, Chief Economist, Federal Housing Administration

The Housing Program of the Federal Emergency Administration of Public Works (309)
Robert B. Mitchell, Housing Division, Public Works Administration

Discussion: Alanson D. Morehouse, Public Works Administration; John R. Riggleman, National Recovery Administration; and Frank R. Garfield, Federal Reserve Board

10:00 A. M.—II. THE CONSUMER IN THE NEW DEAL

Chairman: Paul H. Douglas, University of Chicago

Costs, Prices, and the Consumer (197)
Henry B. Arthur, Consumers Division, National Emergency Council

Codes and the Consumer (191)
Willard L. Thorp, Consumers Division, National Emergency Council

The Consumer's Place in the Organization of the New Deal (185)
Thomas C. Blaisdell, Jr., Consumers Advisory Board

Discussion: Corwin D. Edwards, National Recovery Administration, and Hazel Kyrk, University of Chicago

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